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JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SEVENTY-SECOND ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN BUFFALO, N. Y., DURING THE WEEK OF AUGUST 25TH.

The 1924 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in Buffalo, during the week of August 25th.

For Association Roster see pages x, xii, xiv and xvi.

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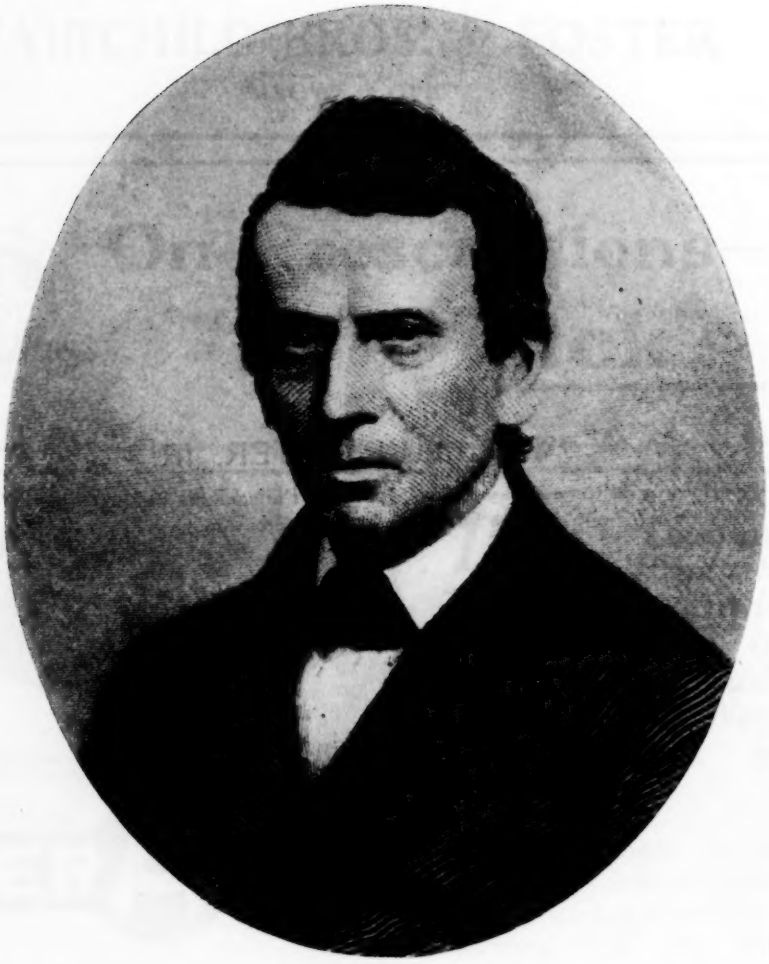
"The Father of American Pharmacy"



WILLIAM PROCTER, JR.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XIII FEBRUARY, 1924 No. 2

WILLIAM PROCTER, JR.

The fiftieth anniversary of the death of William Procter, Jr., on February 10th, and the prospective American Pharmacy Building, prompted the frontispiece of this issue. No attempt will be made to sketch the life of the eminent pharmacist; the recently published volume of "The First Century of the Philadelphia College of Pharmacy" and the PROCEEDINGS of the A. PH. A.* record his activities. The sketch of the latter includes a pen picture of William Procter, Jr., of about the time of the founding of the American Pharmaceutical Association; in part, this follows:

"A young man of medium height, slender, with coal-black straight hair, piercing black eyes which were ready in a moment to sparkle with humor or flash with fire at the thought of injustice done to another; active in movement, solicitous for the welfare of others, modest and retiring in disposition, faithful in his obligations, yet morbidly sensitive to criticism; a charming companion to all who knew him intimately."—JOSEPH P. REMINGTON.

"The American Pharmaceutical Association was the offspring of Procter's able and versatile mind. Throughout the years of his life which followed the organization of that body, he gave to it the richest treasures of an intellect fitted beyond all others for the work which he had undertaken. In 1853 he was chairman of the committee on the progress of pharmacy, and chairman of a committee to report a syllabus of a course of study for students of pharmacy, which committee reported in 1858. He was corresponding secretary of the Association from 1852–1857, first vice-president in 1859–1860, and was elected president in 1862. The pharmacists of America ought not to let the memory of their most distinguished colleague fall into oblivion; they should revere the memory of William Procter, Jr., and should give him a monument more lasting than stone or bronze—a monument built in their affections and in the affections of those who come after them.

"Let us remenber that the favorite child of his genius was the AMERICAN PHARMACEUTICAL ASSOCIATION."—From remarks of ALBERT E. EBERT.

* PROCEEDINGS A. PH. A., 48, 22–28, 1900.

EDITORIAL

E. G. EBERLE, EDITOR 253 Bourse Bldg., PHILADELPHIA

THE GIFTS OF THE ARTS AND SCIENCES.

IN the February number of *The American Magazine* H. G. Wells tells what he thinks will be the great development of the coming century. He refers to the past history of wonderful material achievements and contemplates on the possibilities when more intensive study is given to ourselves in developing wonderful men. He says that "the mind of the intelligent teacher rebels against the aimless work he does, the aimless discharge of young people into an uncharted world. Yet he realizes that he cannot educate with any effectiveness unless he has a clear idea of the sort of life for which he is educating.

"As we reshape our ideas of social justice and relationship, the character of our schools will change and education will realize its aims anew."

The President of the Rockefeller Medical Foundation in reviewing the methods, spirit and scope of modern medicine recently said:

"Medical science, in common with other sciences, relies upon observation, comparison, and experiment, or upon a combination of these methods. The anatomist by observation and comparison, that is, by dissection of human and animal bodies and by examination of the living maps, describes the intricate structure of organic forms and studies the laws of growth and development. The physiologist by physical means, by chemical analysis, by observation of men, and by experiment upon animals, gains insight into the nature of vital processes. The bacteriologist by observing through the microscope the minute plants and organisms which live in blood and tissues, by introducing them into animals under varying conditions, and by comparing results, discovers definite and verifiable facts about the causes of health and disease. The pathologist studies by microscopic methods, by examination of morbid growths, by experimentation upon animals, the nature and effects of organic diseases. The results which each man secures and the methods he employs are made public and are then tested by other investigators. Mere personal opinion and unverified assertion have no place in modern scientific medicine."

These references are presented because they point out in a way, as has been stated frequently before in these columns, that there is a widening field of medical science before us in which medicine, chemistry and the departments of special and direct concern to pharmacists will find much to do. The coöperation of related industries, their laboratories and those of the institutions of the arts and sciences referred to, are coming into closer contact and their coöperative investigations will result in greater achievements and services. E. G. E.

EVERBODY LIKES TO BE IN ON EVERYTHING THAT'S BIG.

IT is, perhaps, generally accepted that the greater number prefer to be on the winning side—to be with those who accomplish; some prefer to be champions of a minority cause. A discussion is not the purpose of the comment; it is to ask for whole-hearted coöperation of not only the majority—but of all pharmacists in behalf of the proposal to establish permanent headquarters for the AMERICAN PHARMACEUTICAL ASSOCIATION—longed for and hoped for, and now a plan is being activated which will bring about accomplishment. Coöperation is an important part of the program.

There must be individual initiative and for success a wide general coöperation is essential. The undertaking is not large when compared with the number of those

who should be interested; twice the amount of the contemplated fund should be obtainable without burdening individuals, if all will do their part. This was the thought of President Frederick J. Wulling in his address of 1917,* and an encouraging message from him follows this comment.[1] E. G. E.

PHARMACISTS' STEWARDSHIP.

PHARMACY is a trust in the hands of the present generation who inherited it from its predecessor and will hand it on to its successor. Progress is the law and principle of civilization. Pharmacists have, therefore, distinctly a two-fold duty, one to themselves and one to their calling. The calling must be looked upon as an entity, an organism to which the members owe allegiance and support and which they must hand down to their successors in a greatly improved and enhanced condition. Many pharmacists forget this duty or are not aware of it and think only of themselves; hence, there is a lack of collective, fraternal and sympathetic support from the body pharmaceutic as a whole, of the very necessary things that need to be done but which can be done only in a big way. Pharmacy ought to have the constructive good-will of every one engaged in any division of the calling. The constructive, helpful effort of each and every member if united and combined will prove to be a force that will accomplish or furnish every reasonable and necessary thing for the lack of which pharmacy is now suffering.

One of the things now lacking is a general pharmaceutical headquarters. The AMERICAN PHARMACEUTICAL ASSOCIATION has proposed to become the agency for actualizing the project. The preliminary steps have already been taken; the question whether such headquarters will be a good thing has been settled affirmatively. If all members of the great body pharmaceutic could understand fully that this project is theirs in their own respective proportions, and that they ought to contribute in those proportions, this great benefit to pharmacy at large and to every individual would be quickly realized and maintained. I think it would be reasonable to expect every individual, firm and corporation in pharmacy to assess their respective working capitals or their profits for fair and proportionate amounts. According to published statements, many millions of dollars in profits and dividends are earned annually by those engaged in all divisions of pharmacy. To raise a million dollars from a very considerable capital or from profits of this capital, or from both, ought to be comparatively easy and could not possibly be burdensome to anyone. Most businesses and enterprises have grown by using portions of the profits for enlargement or expansion. Those who contribute to headquarters fund do not in reality make a donation—they are making a re-investment that will be one of the best they ever made. The collective profits from this investment would be, in a word, a general elevation of American pharmacy in effectiveness and prestige. Let's have the vision and the wisdom to put this project over "big and quick." We would be doing something for ourselves and would in a large measure pay our debt to the past and would have the satisfaction of having endowed, in a modest way, future pharmacy as part of our administration of the trust we inherited.

FREDERICK J. WULLING.

* JOUR. A. PH. A., 6, 781, 1917.

[1] The message of last month's issue on pp. 5 and 6 was contributed by James H. Beal.

THE PHARMACODYNAMICS OF CAAPI.*

BY H. H. RUSBY.

Of the therapy dynamics of Caapi we know nothing, as it has never been used medicinally, so far as known. Of its physiological action, we have considerable knowledge, derived from the accounts of travelers who have seen it used by the aborigines of South America, by whom alone it has been employed. We are to-day to have this scanty and popular information supplemented by a report of some scientific investigations made by our Dr. Pittenger, and it will be of the greatest interest to determine how far these accurate data will agree with those furnished by the aboriginal use of the drug.

Caapi may be defined as the root and rhizome of *Banisteria Caapi*, a woody vine inhabiting the central portion of the basin of the Amazon. It is apparently widely distributed and abundant, and can be supplied cheaply, if found of use in medicine. There is a host of closely similar vines in the same region, some related and some not related to it, which may very easily be mistaken for it, so that great care must be taken to identify it properly. We are, therefore, looking eagerly for the diagnostic description promised by Professor Stanford of the Cleveland School of Pharmacy, to whom this important and difficult study has been assigned.

This plant belongs to the *Malpighiaceæ*, a very large family of tropical plants, mostly woody climbers. The family is related to our *Geraniaceæ*, and is represented in the United States only by a few plants of our extreme southern region. With the exception of a few simple astringents, no member of the family is known to have medicinal properties, so that we have no *a priori* opinions on this subject.

The chemical study of this drug has been undertaken by Dr. Harvey A. Seil of the Seil, Putt & Rusby Laboratory.[1] The composition is complex, there being a number of alkaloids which are proving very difficult of separation. In this particular they are somewhat like those of Nux Vomica.

The active uses of Caapi in southeastern Colombia have been reported by Humboldt and Spruce. The latter botanist gave considerable attention to the subject and has supplied a rather extended account of it in his book of travel. It was encountered by Rice during his explorations in Colombia, though I do not know that he has ever published anything on the subject. Two German explorers, Messrs. Weiss and Schmidt, also made extensive observations on its use, and photographed some of the procedures. So far as I know, they never published their observations, but communicated them verbally to me, and I saw their photographs. It was a bitter disappointment to me when illness prevented me from visiting the region of its use, but I was fortunate in being able to send Mr. Gordon MacCreagh, of New York, an experienced oriental traveler and author, who accompanied me as a motion-picture photographer. Mr. MacCreagh performed his work very thoroughly and successfully, photographing the entire ceremony, obtaining material for study and making use of the beverage himself, so as to determine its general effect.[2]

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* Scientific Section, A. Ph. A., Asheville meeting, 1923.

[1] See a preliminary report on the Chemical Examination of Caapi by Harvey A. Seil and Earl B. Putt in this issue of the JOUR. A. PH. A.

[2] The movie film illustrating his work was shown at the Asheville meeting A. Ph. A. See December JOUR. A. PH. A., p. 1123.

All this information from Colombia has been supplemented by wholly independent observations made in the extreme eastern part of Bolivia by Dr. Orlando E. White of the Brooklyn Botanic Garden. The uses of the drug in the latter region are quite different from those in Colombia, and the drug is known there by the different name, "Ayahasco."

The above reports may be summarized as follows:

In Bolivia, Caapi is used chiefly as a mere exhilarating and stimulating beverage, somewhat like tea and coffee. Its use is very limited and the amount taken at a time is very small. The decoction is always made with the addition of a certain leaf, of which I have specimens, but which I have not as yet identified botanically. There is no information whatever as to the object of adding this leaf.

In Colombia, a leaf is sometimes added, and sometimes not, and I do not know if this is the same leaf that is added in Bolivia. In that country, the object of its use is to give courage and fortitude in facing danger and enduring suffering.[1] The systemic effects of the drug are as follows:

Within a very short time after drinking the decoction, there is a powerful effect on the nervous system and on the circulation. The cutaneous circulation is checked, as manifested by a strong pallor. The subject is restless, and occupies a standing position. There is an intensely anxious or fixed expression to the countenance, and there are convulsive tremors. This condition lasts but a few minutes and is followed by a violent reaction, in which the blood rushes to the surface and the man becomes highly or even violently active. Fear, and even prudence, is entirely destroyed and he becomes extremely active muscularly. He is ready to fight anything and anybody, or any number of enemies and suffering is disregarded. He rushes about and seeks an enemy with the utmost eagerness. This condition lasts for hours, and is followed by more or less exhaustion and somnolence. The nature of this somnolence is in doubt. Some accounts indicate it is a narcotic effect and that there are unnatural dreams and visions. Others indicate that it is the natural reaction following weariness or exhaustion.

Mr. MacCreagh records that he had no desire to fight, and no unusual mental effects beyond that of a powerful stimulation and a desire to dance and otherwise engage in bodily and mental activity. His description suggests the effect of strychnine in some ways.

Dr. Pittenger's preliminary studies will be found to shed some light on the above reports.

THE CHEMICAL EXAMINATION OF CAAPI.*

A Preliminary Report.

BY HARVEY A. SEIL AND EARL B. PUTT.

The Caapi for this investigation was obtained from Dr. H. H. Rusby who discovered it and other valuable botanical specimens in the Mulford Exploration of the Amazon Basin. The drug was received in fine powder from the H. K. Mulford Co.

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[1] See December Jour. A. Ph. A., p. 1123.

* Scientific Section, A. Ph. A., Asheville meeting, 1923.

Following the methods of the A. O. A. C. a chemical analysis showed:

	Per cent.		Per cent.
Moisture	5.20	Other sugars as sucrose	1.07
Ash	5.02	Crude fiber	47.25
Acid-insoluble ash	0.65	95% alcohol extract	8.60
Chloroform extract	1.59	Water extract	10.06
Ether extract	1.04	Volatile oil	0.0042
Petroleum ether extract	0.72	Non-phenolic alkaloids	1.88
Tannin	0.86	Phenolic alkaloids	0.03
Reducing sugars as invert	0.23		

The volatile oil was determined by steam distillation of a 500-gram sample, saturating the distillate with sodium chloride and extracting with ether. After careful evaporation of the ether 0.021 gram of residue was obtained. It was semi-solid and had a disagreeable, heavy, narcotic odor. On dissolving the oil in petroleum ether and shaking with dilute copper acetate solution, the petroleum ether showed a pronounced green coloration.

The petroleum ether extract, obtained from 5 grams of drug by extraction in a Soxhlet extractor, consisted almost entirely of resin. This resin gave a positive Copper Acetate and Lieberman-Storch reaction. When dissolved in petroleum ether to which an equal volume of acetic anhydride was added, and floated on concentrated sulphuric acid, containing a few vanillin crystals, a pink coloration was obtained, gradually growing deeper and turning bluish. On dilution with methyl alcohol, the alcoholic solution showed a clean blue, while the sulphuric acid became brilliant red, changing to blue on solution in alcohol.

ALKALOIDS.

Fifteen grams of drug and 150 cc. of chloroform were placed in a tightly stoppered flask and thoroughly shaken. After ten minutes 5 cc. of 10% ammonium hydroxide were added and the mixture agitated at frequent intervals, then allowed to stand over night. Five cc. of water were then added to agglomerate the drug, and when the drug had settled clear 100 cc. of the chloroform solution were filtered through cotton into a separatory funnel. This represented 10 grams of drug. The chloroform solution was washed with 10 cc. of water to remove water-soluble material, the wash water was extracted with an equal volume of chloroform and rejected. The chloroform solution was extracted with three 20-cc. portions of Normal KOH solution, washing each extract successively with the wash chloroform obtained above. The combined alkali extracts were acidified with HCl and reserved for the determination of phenolic alkaloids.

The chloroform solution containing non-phenolic alkaloids was extracted with dilute sulphuric acid until free of alkaloid, determined by testing with Mayer's reagent. The combined acid extracts were then made alkaline with ammonium hydroxide and the alkaloids extracted in the usual manner with chloroform. The chloroform extracts were washed with water and filtered into a tared flask. The chloroform was evaporated and the alkaloids dried to constant weight at 100° C. Non-phenolic alkaloids—1.88 per cent. The acid solution of the phenolic alkaloids was made alkaline with ammonium hydroxide and the alkaloids were extracted with chloroform. The chloroform solution was then completely extracted with dilute sulphuric acid, the acid solution made alkaline with ammonium hydroxide

and extracted with chloroform as in the determination of the non-phenolic alkaloids. Phenolic alkaloids—0.03 per cent.

The separation of the alkaloids on a larger scale points to the presence of at least three alkaloids in Caapi—first, a phenolic alkaloid; second, a non-phenolic alkaloid forming a difficulty soluble hydrochloride; third, a non-phenolic alkaloid forming a more readily soluble hydrochloride.

None of these has been isolated in sufficiently pure form to report on their reactions and properties at this time, except that the non-phenolic alkaloids in solution either in dilute hydrochloric or sulphuric acids exhibit a beautiful blue fluorescence, very similar to that of quinine. These alkaloids form a golden yellow solution in chloroform and readily crystallize on evaporation of this or other solvents. The separation and properties of the alkaloids are under investigation and will be reported in a future paper.

RESEARCH LABORATORIES,
SEIL, PUTT AND RUSBY, INC., NEW YORK CITY.

MIRÉ (MEÉ-RAY).*

BY H. H. RUSBY.

All that is known of this interesting drug is comprised in a few brief statements communicated by the Indians of Central Bolivia, who alone have employed it in medicine. These statements, which I have previously quoted in published references, may be repeated here for the purpose of comparison with the following report by Dr. Thomas S. Githens, of his pharmacodynamic experiments.

I have found no clue to the family relationship of the Miré plant, in the specimens collected, which consist of roots and leafy stems, with no indication of either flowers or fruits. The plant is a small shrub, with alternate estipulate leaves, the latter somewhat resembling those of Manaca. The wood is extremely tough and hard and its structure is like that of some Solanaceae. The Indian method of extraction is by boiling, which does not appear to injure the active constituent. This fact suggests an alkaloidal nature of the latter.

All that the Indians know of its action is that full doses produce the following symptoms and results:

1. There is a paralysis of all voluntary muscles, precisely like that produced by alcoholic intoxication, and which may result fatally, if the dose is large enough.
2. There is no disturbance of sensation or intellect.
3. After a time, there is a profuse perspiration of the cold type, suggesting sympathetic paralysis.
4. This perspiration is capable of destroying all cutaneous parasites, which suggests cutaneous excretion of the active constituent of the drug. This would indicate stimulation of the sweat glands.

It will be observed that the results obtained by Dr. Githens corroborate the first of these statements, that as to muscular paralysis, and the last, as to stimulation of the sweat glands.

It may be added that so far as is now known to the natives of the producing

* Scientific Section, A. Ph. A., Asheville meeting, 1923.

region, the plant is so scarce as to present no commercial possibilities, except as a result of cultivation. It is not impossible, however, that future discovery may extend the range and increase the supply.

It would appear from all the evidence at hand that this drug possesses physiological properties distinct from those of any other known.

PRELIMINARY REPORT ON STUDIES OF MIRÉ.*

BY THOMAS S. GITHENS, M.D.

The active principles seem to be completely extracted by hot water, and by various strengths of alcohol from 10 per cent. to 95 per cent. Extraction by ether, chloroform and acetone yields weaker preparations.

Preparations, however made, were similar in action and there was no evidence of two principles differing in the nature of their effect.

The principles were not injured by boiling and were not volatile in steam.

In frogs, full doses bring on a remarkable condition, in which the frog lies extended, incapable of voluntary motion, and without respiratory movements, but twitching all over continuously and violently. All the voluntary muscles seem to be involved in these weak, irregular, spasmodic contractions. This condition may last for several days during which, in spite of the paralysis, the heart continues to beat almost normally. The heart generally stops beating after two to four days, probably as a result of exhaustion, and asphyxia.

The tremors are not influenced by decapitation, nor by section of the cord. If the sciatic nerve is cut before the injection is given, the twitching occurs, but usually less actively than in the intact leg. If the leg is ligated at the hip, leaving the nerve free, no twitching occurs in that leg, although there is loss of voluntary motion.

There is no curare action. The skin shows increased secretion of mucous.

In mice, large doses cause twitching of the leg muscles followed by jerky, irregular respiration, and finally by paralysis of voluntary muscles. Death results from respiratory paralysis, the fatal dose being about 0.3 mg. per gram.

In rabbits, intravenous injections of 2 cc. of a ten per cent. infusion per kilogram caused slowing of the pulse with slight rise of blood pressure, increase of knee jerks and salivation. In certain experiments, increased peristalsis was seen.

These experiments indicate that Miré causes:

Paralysis of voluntary motion by an action on the spinal cord.

A stimulation of the peripheral motor-apparatus, resulting in twitching of the muscles.

A stimulation of the salivary and of the sweat mechanism as seen in rabbits and in frogs.

Slowing of the heart, probably from vagus stimulation.

Stimulation of peristaltic movements may occur.

BIOLOGICAL LABORATORIES,
H. K. MULFORD COMPANY,
PHILADELPHIA, AUGUST 28, 1923.

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* Scientific Section, A. Ph. A., Asheville meeting, 1923.

KINO, GAMBIR AND CATECHU.*

BY E. N. GATHERCOAL.

The preparation of the monographs of kino and gambir for the tenth revision of the U. S. Pharmacopœia has led to a study of these astringent substances and their comparison with black catechu. Our studies are not complete but we present herewith the data obtained to date.

The investigation has developed along the lines indicated by the following questions:

1. Do these astringent drugs deteriorate upon aging?
2. Is the solubility in water, alcohol or hydroalcohol a suitable test for the determination of the quality of these drugs?
3. Are there any tests of identity for these drugs?
4. Why is gambir preferable to black catechu as an astringent drug?

As a preliminary thought, let us assume that the therapeutic value of the three drugs lies in their astringency and that their active principles are the astringent substances present in them.

Kino-tannic acid is the name applied to the water-soluble astringent substance or substances of kino, and catechu-tannic acid to the similar substances of catechu and gambir. These tannic acids belong to the group of non-glucosidal tannins that form a green coloration with ferric salts, a precipitate with bromine water, produce catechol upon prolonged heating, phlobaphenes upon treatment with dilute acids and protocatechuic acid when fused with potassium hydroxide. Hence, they differ markedly from the gallo-tannins, that are glucosidal, form a blue-black coloration with ferric salts, no precipitate with bromine water, pyrogallol upon volatilization and gallic or ellagic acid upon treatment with dilute acids or when fused with alkalies.

Along with catechu-tannic acid, there is present in catechu, for instance, catechin and probably several anhydrides of catechin. To catechin, which is obtainable in white silky crystals, the formula $C_{19}H_{18}O_8$ is usually assigned. Allen ("Commercial Organic Analysis," 4th ed.) suggests the following series of anhydrides:

Catechin $C_{38}H_{36}O_{16}$ ($2C_{19}H_{18}O_8$)	Dianhydride $C_{38}H_{32}O_{14}$
Catechu-tannic acid $C_{38}H_{34}O_{15}$	Tri-anhydride $C_{38}H_{30}O_{13}$
Catechuretin $C_{38}H_{28}O_{12}$	

Catechin possesses no acid properties, does not precipitate gelatin or the alkaloids as do the tannins, is readily soluble in alcohol, ether and boiling water but only slightly so in cold water. When heated, catechin forms catechu-tannic acid.

Catechu-tannic acid, a dark reddish brown powder, though its color may be due to the presence of impurities, precipitates gelatin and the alkaloids, is readily soluble in cold water, alcohol and ethyl acetate but insoluble in ether. When heated, it forms catechal and with dilute acids forms water-insoluble phlobaphenes.

Allen states that phlobaphenes are red or brown amorphous substances which are but slightly soluble or sometimes insoluble in either cold or boiling water or in weak acid solutions or in ether but are soluble in dilute solutions of the alkalies and in alcohol. The greater the anhydration of the phlobaphenes the less the solubility in water. Those that are water-soluble precipitate gelatin, combine with hide

* Scientific Section A. Ph. A., Cleveland meeting, 1922.

to form leather and behave with many reagents like their respective tannins.

Kino, correspondingly, is said to possess:

Kinoin	$C_{28}H_{24}O_{12}$ ($2C_{14}H_{12}O_6$)	Kino red	$C_{28}H_{22}O_{11}$
Kino-tannic acid	$C_{28}H_{21}O_{11}$	Dianhydride	$C_{28}H_{20}O_{10}$

There is much confusion regarding the formulas of these substances. Kino-tannic acid has not been isolated in a positively pure form. Yet that a series of anhydrides exists seems to be well established.

Kinoin has been obtained in colorless crystals. It does not precipitate gelatin, dissolves readily in boiling water, in alcohol and in ether and but slightly in cold water.

The proportion of these substances present in the drugs under discussion varies so widely that it is difficult to correlate the reports of various investigators. Allen states:

Catechu contains tannin 45–55%, catechin 30–40%
Gambir contains tannin 36–40%, catechin 20–30%
Kino contains tannin 75%, kinoin in small amount

The data we have obtained regarding the solubility of these three drugs are compared with the statements made in a number of standard texts; *viz.:*

"Pharmacopœia of the United States IX" (U. S. P.)
"British Pharmacopœia, 1914" (B. P.)
"Deutsches Arzneibuch," 5th ed. (G. P.)
"National Standard Dispensatory, 3rd ed." (N. D.)
"Kraemer's Pharmacognosy," 2nd ed. (Kr.)
"Greenish's Pharmacognosy" (Gr.)
"Flückiger and Hanbury's Pharmacographia" (Fl.)

The work of Professor R. L. Newcomb (New.) on moisture and ash published in the U. S. P. X Revision Bulletins is also quoted.

As indicated by the following list we have examined fifteen specimens of kino, eleven of gambir and eleven of black catechu. The specimens are numbered according to their age, the more recent bearing the larger numbers. However, with some of the older specimens it was impossible to determine their exact age and even with recent purchases we have no way of ascertaining the age back of the date of purchase, but in every case the specimen is at least as old as the year indicated.

Kino.	Gambir.	Catechu.
1—Yo. 1922	1—Yo. 1922	1—Yo. 1922
2—L. & F. 1921	2—L. & F. 1921	2—L. & F. 1921
3—L. & F. 1921	3—L. & F. 1921	3—Chaw. 1921
4—New. 1921	4—L. & F. 1918	4—L. & F. 1919
5—L. & F. 1920	5—L. & F. 1915	5—U. of I. 1910
6—L. & F. 1917	6—L. & F. 1914	6—P. D. & Co. 1903
7—P. V. & Co. 1917	7—P. V. & Co. 1914	7—L. & F. 1900
8—L. & F. 1915	8—P. D. & Co. 1903	8—E. L. & Co. 1900
9—Go. 1910	9—E. L. & Co. 1900	9—Go. 1900
10—Go. 1910	10—L. & F. 1922	10—G. L. & Co. 1893
11—P. D. & Co. 1903	11—F. M. & Co. 1922	11—N. W. U. 1893
12—U. of I. 1900		
13—U. of I. 1900		
14—E. L. & Co. 1900		
15—G. L. & Co. 1893		

COMMENTS.

Under Kino, Sample 10 was in angular pieces up to a centimeter across, rather dull in appearance and resembling black catechu fairly uniformly broken. Sample 12 was in powdered form and at least 22 years old in this form. Sample 13 was very finely granular and dull in appearance.

Under Gambir, Samples 7, 8 and 11 were the soft variety of gambir which had become dried into irregular-shaped, blackish masses. All other samples were brown cube gambir. Samples 10 and 11 were added after some experimental work had been done and hence are not in proper chronological order.

ASH.

Kino.

U. S. P.—not more than 3%.
B. P.—not more than 2.5%.
Fl.—1.3%.
N. D.—1% to 2.5%.

New.	Total.	Ac. insol.
1	2.56%	0.50%
2	6.23	0.14
3	6.25	0.14
4	6.76	0.23
5	8.14	0.09

E. N. G			
1	1.1%	12	6.5
2	5.4	13	5.4
3	4.8	14	1.0
4	5.6	15	1.5
5	2.2		
6	5.1		
7	6.0		
8	1.6		
9	1.5		
10	1.5		
11	1.9		

Gambir.

U. S. P.—not more than 9%.
B. P.—not more than 5%.
Powd.—not more than 8%.
Gr.—5%.
Fl.—2.6%.
N. D.—not more than 6%.

New.	Total.	Ac. insol.
1	5.74%	2.12%
2	5.49	0.91
3	7.79	2.63
4	6.91	1.06

E. N. G.		
1	2.8%	0.2%
2	4.3	0.4
3	4.1	0.4
4	4.5	0.4
5	3.2	0.2
6	4.1	0.2
7	7.0	0.2
8	..	..
9	..	..

Catechu.

B. P.—not more than 5%.
Powd.—not more than 8%.
G. P.—not more than 6%.
Kr.—5%.
Gr.—2% to 3%.
N. D.—5%.

New.	Total.	Ac. insol.
1	6.76%	0.00%
2	8.53	0.11
3	8.91	0.28
4	9.38	0.00

E. N. G.		
1	9.3%	0.94%
2	5.1	0.9
3	9.7	0.7
4	7.5	1.2
5	..	..
6	8.6	2.1
7	7.5	1.5
8	8.0	0.5
9	6.5	0.9
10	12.4	0.8
11	14.0	0.6

COMMENTS.

It is to be noted that according to Newcomb the ash of kino frequently exceeds the 2.5% limit of the B. P. and even the 3% limit of U. S. P. IX. Our results indicate in 7 out of 15 specimens an ash greater than 3%. In all cases the acid-insoluble ash is less than 1%. The ash appears to be mostly soluble in boiling water but not in alcohol.

The ash of gambir in none of Newcomb's 4 samples nor in any of our 7 samples equaled the 9% limit of U. S. P. IX but in several instances exceeded the 5% limit of the B. P., though the B. P. does permit 8% of ash in powdered gambir. George E. Ewe[1] suggests 8% as the ash limit of gambir. This appears to be sufficiently liberal.

The ash of catechu rises notably above the 5% limit of the B. P. In all of Newcomb's 4 samples and in the 10 samples we report upon the ash exceeds 5%, rising in one instance to 14%. However, the acid-insoluble ash in every case is low.

[1] JOUR. A. PH. A., 1920, pp. 309–10.

MOISTURE.

Kino.	Gambir.	Catechu.
U. S. P.—not more than 12%.	Gr.—9% to 11%.	Gr.—12% to 15%.
N. D.—13% to 15%.	New.—4% to 9% at 150° F.	
New.—5% to 7.45% at 150° F.		
E. N. G.—at 102° C.		
1—13.5%	1— 9.8%	1—10.4%
2— 8.2	2— 8.5	2— 9.5
3—10.8	3— 8.8	3— 9.9
4—11.2	4— 8.4	4— 8.67
5—10.7	5— 9.1	5— ..
6— 9.1	6— 9.2	6—11.6
7— 9.27	7—13.2	7—10.0
8—12.4	8— ..	8— 8.8
9—12.8	9— ..	9—10.85
10—12.4		10— 9.23
11—11.2		11—10.6
12—11.18		
13—10.98		
14—11.2		
15—13.0		

COMMENTS.

The 12% moisture limit of the U. S. P. for kino is none too liberal for the specimens we report upon. Of the 15 samples 5 have moisture slightly exceeding 12%.

Greenish states that gambir contains 9 to 11% of moisture while black catechu contains 12 to 15%. We noted no difference in the average moisture content of the two drugs.

SOLUBILITY IN HOT WATER.

Kino.	Gambir.	Catechu.
U. S. P.—not less than 40%.	B. P.—almost entirely.	B. P.—almost entirely.
B. P.—not less than 75%.	Gr.—almost entirely.	Fl.—completely.
Fl.—almost entirely.	N. D.—a turbid solution.	Kr.—almost entirely.
Gr.—more than 80–90%.		G. P.—insol. res. not more than 15%.

E. N. G.

	Kino.			Gambir.			Catechu.		
	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.
1	3.2	96.8	83.8	10.6	89.4	76.5	0.5	99.5	88.0
2	0.6	99.4	90.8	10.5	89.5	80.8	0.5	99.5	86.5
3	1.0	99.0	86.5	13.7	86.3	71.0	0.7	99.3	92.4
4	0.5	99.5	86.8	10.6	89.4	81.2	4.5	95.5	85.5
5	10.7	89.3	80.7	10.6	89.4	75.0	7.2	92.8	80.0
6	0.5	99.5	87.9	10.6	89.4	76.8	11.3	88.7	75.5
7	1.1	98.9	85.6	39.7	60.3	49.2	17.6	82.4	74.0
8	20.4	79.6	67.4	14.3	85.7	79.0	12.4	87.6	75.0
9	71.8	28.2	16.1	16.4	83.6	....	18.5	81.5	69.0
10	40.4	59.6	47.5	2.8	97.2	88.8	13.9	86.1	79.5
11	53.7	46.3	33.5	15.0	85.0	74.0	14.3	85.7	74.4
12	61.9	38.1	25.0						
13	60.6	39.4	27.2						
14	55.5	44.5	40.0						
15	55.0	45.0	33.4						

A. I. R. = percentage of anhydrous insoluble residue.
Sol. = percentage solubility in hot water (approximately 100° C.).
A. A. E. = percentage of anhydrous aqueous extractive at 100° C.

COMMENTS.

The solubility in hot water and the aqueous extract at 100° C. was determined as follows:

Macerate 1 Gm. of the powdered drug (not coarser than No. 40) in about 50 cc. of boiling water in a suitable flask and maintain at nearly 100° C. in a water-bath with frequent shaking or stirring for 2 hours. Filter into a weighed filter in suitable apparatus in a water-bath maintained at nearly 100° C. Wash the flask with boiling water to remove all the residue into the filter and add sufficient boiling water through the filter to make 100 cc. of filtrate. Dry the residue on the filter to constant weight. The difference obtained by deducting the weight of the anhydrous insoluble residue from the weight of powdered drug taken, expressed in percentage, gives the solubility of the drug in hot water.

Evaporate on a water-bath in a suitable tared dish, an aliquot part of the clear, hot filtrate to a residue and dry the same at 102° C. to constant weight. The weight of the dried residue expressed in percentage gives the anhydrous hot water extractive.

It would appear from the data submitted that the minimum limit set by the U. S. P. for kino of 40% soluble in hot water is very much too low. Even the limit of 75% set by the B. P. is much too low for a reasonably recent kino. The first 7 specimens that we examined were mostly 1 and 2 years old though some were 5 or 6 years old and all are 90% or more soluble in boiling water, while the last 8 specimens are all 8 years or more, even up to 25 or 30 years old, and all fall away below 90% solubility. We are convinced that no kino less than 90% soluble in boiling water is suitable for medicinal use.

The anhydrous aqueous extract plus the anhydrous insoluble residue plus the moisture should equal 100%. We could seldom get these figures exact, but frequently quite close. The anhydrous hot water extract as a constant has an advantage over the solubility determination in that it is not influenced by moisture in the drug. A standard of 80 per cent. of hot water extractive for kino would insure a good quality of drug.

Gambir in boiling water gives a more or less turbid mixture which results in a considerable residue upon filtration. Furthermore, filtration frequently is slow and difficult. Aging the gambir seems to make no difference in its solubility. The soft varieties of gambir, when dried, were somewhat less soluble than the cube gambir; 75 per cent. of anhydrous hot-water extractive would insure a good quality of drug.

Catechu, like kino, is very soluble in boiling water when not aged and of about the same solubility as gambir when aged. The filtrate, upon cooling, usually becomes turbid. It would appear as though a catechu suitable for medicinal use should be not less than 85% soluble in boiling water and 75 per cent. of anhydrous hot water extractive would be a very fair standard for the drug.

Perhaps the criterion frequently employed in the German Pharmacopœia, *viz.*, the anhydrous insoluble residue, is equal in value to either the solubility or the extractive determinations. It requires somewhat less manipulation and calculation than either of the others. An anhydrous insoluble residue after complete extraction with water at 100° C. of not more than 10 per cent. for kino and 15 per cent. for gambir and catechu would insure a good quality of drug.

SOLUBILITY IN COLD WATER.

	Kino.			Gambir.			Catechu.		
	U. S. P.—partly. B. P.—slowly and incompletely. Gr.—80 to 90%. Fl.—all but a pale flaky residue. N. D.—partly, with a flocculent residue. E. N. G.			U. S. P.—not less than 65%. Kr.—85%. N. D.—75%. E. N. G.			B. P.—partly. Fl.—a small portion soluble. Kr.—somewhat. E. N. G.		
	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.
1	32.7	67.3	58.4	20.1	79.9	65.2	6.6	93.4	86.0
2	10.3	89.7	77.2	22.2	77.8	68.0	8.3	91.7	85.6
3	7.5	92.5	82.4	21.2	78.8	64.8	8.4	91.6	82.8
4	0.1	99.9	87.2	24.0	76.0	62.0	17.2	82.8	73.2
5	48.2	51.8	41.2	19.5	80.5	68.8	30.4	69.6	57.6
6	16.8	83.2	74.4	27.7	72.3	61.2	22.1	77.9	66.0
7	14.2	85.8	77.2	59.4	40.6	26.8	....	....	....
8	57.5	42.5	30.4	30.2	69.8	56.0	28.5	71.5	61.6
9	78.3	21.7	8.8	....	....	....	27.3	72.7	62.4
10	69.1	30.9	18.8	17.1	82.9	76.0	32.5	67.5	58.4
11	....	....	....	36.0	64.0	53.2	61.8	38.2	32.4
12	83.2	16.8	7.2						
13	74.3	25.7	13.2						
14	....	....	....						
15	80.7	19.3	10.8						

A. I. R. = Anhydrous insoluble residue.
Sol. = Solubility in water (approximately 20° C.).
A. A. E. = Anhydrous aqueous extractive at 20° C.

COMMENTS.

The solubilities in cold water and the cold water extractive were obtained by the following process:

One gram of the powdered drug (not coarser than No. 40) is macerated for 2 hours in about 50 cc. of water at approximately 20° C. and frequently shaken or stirred. Obtain the complete undissolved residue upon a tared filter, washing with sufficient water to make 100 cc. of filtrate. Dry the residue on the filter to constant weight. The difference obtained by deducting the weight of the anhydrous insoluble residue from the weight of powdered drug taken, expressed in percentage, gives the solubility of the drug in water at 20° C.

Evaporate on a water-bath in a suitable tared dish, an aliquot part of the clear filtrate to a residue and dry the same at 102° C. to constant weight. The weight of the dried residue expressed in percentage of the weight of powdered drug taken gives the anhydrous cold water extractive.

Under Kino, the statements of the U. S. P. and B. P. and N. D. are correct but not very specific. A fresh kino will usually meet the requirements of Greenish, 80–90% soluble.

The requirement of the U. S. P. for gambir, namely, not less than 65% soluble, might well be raised to 75%, the figure named by the N. D. The 85% figure of Kraemer seems to be high.

The three most recent samples of catechu were above 90% soluble, and the fourth sample above 80% soluble. The other samples ranged from 38% to 78%.

The principal question in connection with the cold water solubility of these three drugs seems to be whether cold water will serve as a critical criterion of quality as well as hot water. There is no question but that cold water is easier

to use, not only because of the employment of less apparatus and less manipulation but because the results of repeated operations in various hands are much more uniform than when boiling water is used. Especially does this apply to gambir, where with hot water the filtration is frequently very slow and difficult, sometimes requiring 24 hours in the hot apparatus to complete the filtration of 100 cc. Furthermore, while the solubility of gambir in cold water is about 10 or 12 points less than in hot water, yet the results from cold water are just as uniform as those from hot water; 60 per cent. of cold water extract would insure a good quality of gambir.

SOLUBILITY IN ALCOHOL.

Kino.			Gambir.			Catechu.		
U. S. P.—not less than 45% extractive.			U. S. P.—not less than 60%.			B. P.—not less than 60%.		
B. P.—almost entirely.			B. P.—not less than 80%.			Kr.—70%.		
Gr.—almost entirely.			Gr.—not less than 80%.			N. D.—60%.		
Fl.—almost entirely.			Kr.—not less than 70%.			G. P.—insol. residue not more than 30%.		
N. D.—entirely.			E. N. G.			E. N. G.		
E. N. G.								
	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.
1	0.3	99.7	86.5	30.2	69.8	61.5	17.1	82.9	72.4
2	40.1	59.9	52.8	27.6	72.4	62.5	36.1	63.9	58.4
3	56.2	43.8	34.8	16.1	83.9	75.0	59.0	41.0	36.0
4	19.0	81.0	71.5	18.8	81.2	70.5	28.6	71.4	63.0
5	24.7	75.3	66.0	30.9	69.1	60.0	29.1	70.9	62.8
6	59.3	40.7	32.0	26.2	73.8	65.0	39.0	61.0	48.5
7	36.2	63.8	60.0	67.0	33.0	20.5	59.5	40.5	29.0
8	25.9	74.1	63.5	22.6	77.4	70.0	81.9	18.1	8.0
9	70.5	29.5	16.5	32.6	67.4	58.5	70.1	29.9	21.5
10	23.5	76.5	63.6	25.3	74.7	68.0	78.3	21.7	11.5
11	56.5	43.5	36.0	42.9	57.1	46.0	74.4	25.6	14.5
12	79.4	20.6	15.0						
13	83.9	16.1	12.5						
14	58.0	42.0	31.5						
15	61.9	38.1	28.0						

COMMENTS.

The solubility in alcohol and the alcoholic extract were determined by the same procedure as the solubility in cold water and the aqueous extract, except that alcohol (95%) was used for the extraction.

Kino, almost universally claimed to be almost entirely soluble in alcohol, always left a marked insoluble residue with us. Only one of the samples examined, sent to us as a recent importation, was over 90% soluble. Other samples, but two or three years old, were only 40%, 60% or 75% soluble, and samples up to 25 years old were down to but 16% soluble. The U. S. P. standard of not less than 45% of alcoholic extractive might be increased to some extent.

One specimen obtained from a New York importing firm last year and claimed to be 90% soluble in alcohol was found to contain 59.2% of anhydrous insoluble residue and therefore possessed a solubility in alcohol of about 40%. In comparison with other samples of known age, this sample was probably 5 years old when we examined it. The firm's chemist undoubtedly examined it soon after importation. Its solubility in alcohol might have decreased this much in 5 years.

To test further the alcoholic solubility of this sample, we macerated in a water-bath 1 Gm. of No. 40 powder in 40 cc. of alcohol, in a 125-cc. flask with a reflux condenser for 2 hours, filtered and dried as indicated above. The anhydrous insoluble residue was 58.9%, a difference by the use of hot alcohol for 2 hours of 0.3%. Furthermore, we prepared flasks with 1 Gm. of the powder in each and treated them as indicated above with cold alcohol, except that the maceration in alcohol was only 20 minutes for the first flask and was lengthened 20 minutes for each succeeding flask to 360 minutes for the last flask. The anhydrous insoluble residue from the first flask was 73.5%, from the last flask 58.0%. The graduation of the residues was not perfect, yet fairly good; it is evident that after 2 hours, further maceration is of no value. The solubility of kino in alcohol is a criterion of its age and its value.

Gambir in alcohol seems to run about half way between the 60% limit of the U. S. P. and the 80% limit of the B. P. Of the 11 samples examined 2 were above 80%, 4 were between 70 and 80%, 3 were between 60 and 70%, and 2 were below 60%.

Catechu, like kino, is less soluble in alcohol upon aging. Of the eleven lots examined only three gave less than 30% insoluble residue, the G. P. limit, and but five exceeded 60% solubility, the B. P. limit.

SOLUBILITY IN DILUTED ALCOHOL.

	Kino.			Gambir.			Catechu.		
	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.	A. I. R.	Sol.	A. A. E.
1	5.8	94.2	80.8	15.3	84.7	75.0	2.0	98.0	86.0
2	3.2	96.8	85.2	15.2	84.8	76.5	7.2	92.8	86.0
3	8.7	91.3	80.0	7.8	92.2	83.6	6.4	93.6	84.0
4	11.5	88.5	76.0	7.1	92.9	83.5	3.5	96.5	88.0
5	18.8	81.2	69.2	14.3	85.7	76.0	21.2	78.8	69.2
6	12.0	88.0	79.2	12.5	87.5	75.2	18.5	81.5	68.8
7	2.3	97.7	88.4	72.6	27.4	21.5	....	....	....
8	25.3	74.7	63.2	9.4	90.6	79.5	22.1	77.9	66.4
9	61.1	38.9	26.8	12.2	87.8	71.5	22.4	77.6	68.0
10	27.0	73.0	62.8	3.1	96.9	82.0	22.2	77.8	68.0
11	61.8	38.2	30.4	17.3	82.7	71.2	10.3	89.7	78.0
12	....	....	....						
13	44.2	55.8	45.2						
14	....	....	....						
15	53.3	46.7	34.4						

COMMENTS.

The solubility in diluted alcohol and the anhydrous diluted alcohol extractive were obtained by the same process employed for determining the solubility in alcohol and the alcoholic extractive, except that diluted alcohol, U. S. P., was used to extract the drugs.

The percentage of solubility in diluted alcohol of each sample of each drug is usually somewhat less than in boiling water, and considerably more than that in alcohol.

The solubility of the seven more recent samples of kino ranged from 97.7 to 81.2%, the eight older samples being much less soluble. An extractive standard of 75% would include all of the kino of value.

The gambir samples were soluble, with one exception, to the extent of 82.7 to 92.9%. An extractive standard of 70% would exclude but one of the 11 samples examined and 75% would exclude only the 3 poorest samples.

Black catechu likewise is quite soluble in diluted alcohol, the range of the 11 samples being from 77.6 to 98.0%. An extractive standard of 75% would exclude 5 of the 10 samples examined. A standard of 65% would include all of the samples examined.

The method of preparing Tincture Gambir Compound as presented in the U. S. P. which calls for maceration in diluted alcohol for three days and subsequent filtration, apparently cannot be improved, for the extractive obtained, on the average, with diluted alcohol equals that obtained with hot water and exceeds that obtained with cold water or strong alcohol.

Also the method for preparing Tincture of Kino as presented in the U. S. P. which calls for extraction with hot water kept on the water-bath for an hour, filtration and the subsequent addition of an equal volume of alcohol is very good, for not only is the troublesome enzyme which causes gelatinization destroyed but the kino is dissolved to the greatest extent by hot water.

CONCLUSION.

1. The ash of kino is found frequently to run higher than the 2.5% allowed by the British Pharmacopœia or even the 3% of the U. S. P. Likewise the ash of black catechu in all instances exceeded the 5% limit of the British Pharmacopœia and in only one case was lower than the 6% permitted by the German Pharmacopœia. On the other hand, the ash of gambir was invariably lower than the 9% limit of the U. S. P. and usually lower than the 5% of the British Pharmacopœia.

2. If the percentage of the hydro-alcohol-soluble astringent constituents of kino, gambir and black catechu is a criterion of the therapeutic value of these astringent drugs, then kino markedly deteriorates upon aging, catechu does so to some extent, but gambir shows but slight change in this respect.

3. A good quality of kino or black catechu is at least 90% soluble in boiling water and gambir at least 85% soluble in boiling water. Samples of kino more than a few years old are less soluble, some old lots of kino being only 30% to 40% soluble in boiling water.

4. As catechin to the extent of 20–40% is claimed to be present in catechu and gambir and to be insoluble in cold water, a marked falling off in the cold water solubility of these drugs might be expected. This decrease in solubility as compared with the solubility in boiling water was, on the average, 16%. Kino, which is said to contain but little kinoin which is likewise insoluble in cold water, however, also showed a decrease of 16% as the average of the seven most recent samples.

As the cold water solubility of gambir is quite as uniform as that in boiling water and because of the great difficulty in filtering a hot aqueous gambir mixture, it is recommended that the solubility of gambir in cold water be preferred to that in hot water as a criterion. A requirement of 75% would exclude but the 4 poorest of the 11 samples examined.

5. While kino is generally credited with being almost entirely soluble in alcohol, only one specimen of the 15 examined was 90% or more soluble in alcohol. This kino was of recent importation. Aging even of one or two years decidedly

reduces the solubility in alcohol and long aging renders the kino almost insoluble. As a criterion of quality, if the requirement is put high, 90%, where it should be, kino must be used immediately upon importation or some means be found for its preservation against deterioration. If put low, 60%, its value as a criterion is doubtful.

Gambir in alcohol easily met the 60% solubility requirement of the U. S. P., but only two samples out of eleven met the 80% requirement of the British Pharmacopœia. A standard of 65% would be satisfactory.

Of catechu, but three samples out of eleven met the German Pharmacopœia requirement of 70% solubility in alcohol and but 5 samples met the 60% requirement of the British Pharmacopœia.

6. The percentage of solubility in diluted alcohol of each sample of each drug is usually somewhat less than that in boiling water and considerably more than that in alcohol.

7. The anhydrous extract as a constant has an advantage over the solubility determination in that it is not influenced by moisture in the drug.

An anhydrous hot water extractive standard of 80 per cent. for kino, 75 per cent. for catechu and 75 per cent for gambir would insure satisfactory drug.

An anhydrous cold water extractive standard of 60 per cent. would be satisfactory for kino or catechu and especially so for gambir.

An anhydrous alcoholic extractive standard of 60 per cent. for gambir might be a valuable criterion. The present U. S. P. standard of not less than 45 per cent. for kino seems low, but cannot be appreciably raised without excluding all but the most recent importations of kino. The same standard might be used for catechu.

A standard of 75 per cent. of anhydrous diluted alcohol extractive would insure a good quality of kino, gambir or catechu.

8. The anhydrous insoluble residue as a criterion of quality of these drugs has the following advantages over either the solubility or the anhydrous extract:

1.—Most easily and accurately obtained.

2.—Not affected by the percentage of moisture in the drug.

3.—Most critical.

Suitable standards would be as follows:

	Kino.	Gambir.	Catechu.
From boiling water	10%	15%	10%
From cold water	30%	30%	30%
From alcohol	35%	35%	35%
From diluted alcohol	20%	20%	20%

9. The U. S. P. methods for the preparation of Tincture Kino and Tincture Gambir Compound embody the best means for extracting the respective drugs and apparently cannot be improved upon.

PHARMACOGNOSY LABORATORY,
UNIVERSITY OF ILLINOIS,
SCHOOL OF PHARMACY,
CHICAGO

THE ACTION OF CERTAIN CHEMICAL AGENTS ON THE STERILITY AND ACTIVITY OF TISSUE EXTRACTS.*

BY WYLY M. BILLING.

In the past we have had several methods open to use for the sterilization of organic extracts. Heat is most commonly used and is generally effective, as regards the sterilization of the extract but frequently reduces the potency of the extract by denaturization. In part this difficulty has been overcome by pasteurization at the hydrogen ion concentration at which the extract shows the greatest stability. For those extracts that are exceedingly thermo labile the candle filter is generally used. Even here a study of the hydrogen ion concentration has proved of value. Dudley, in 1923 (1), has shown that the newly discovered insulin, the sterilization of which has always been attended with some loss, may be filtered without detectable loss by first rendering the solution alkaline to p_H 7.5.

When Mills, in 1921 (2), succeeded in isolating what he considers the natural coagulating agent of tissue, that is, tissue fibrinogen, and showed that, when freed from toxic albumins and foreign tissue, it could be safely depended on for the control of hemorrhage by internal administration, it became necessary to devise some method for the sterilization of the final suspension before any use could be made of the discovery.

Tissue fibrinogen because of its chemical nature defied the customary methods of sterilization. In the first place, even the heat necessary for tyndallization was found to so denaturize it as to cause a great decrease in its activity. In its active form it is a finely divided suspension and for this reason a candle filter could not be used. Changing the hydrogen ion concentration from the isoelectric point results in a complete solution which can be berkfelded but this also destroys the activity.

With these points in mind we undertook a study of the effect of chemical agents in sterilizing the product and also upon its activity.

It was necessary at the outset to use only those chemical agents which would not, in the quantity employed, be toxic to the host and it was hoped indeed to find one that would not even have an irritating effect on injection.

The method employed was, in general, to add the agent under examination in a definite quantity to a solution of tissue fibrinogen of known potency and thereafter determine the presence of microörganisms by culturing out on agar-agar plates which were incubated 48 hours at 37° C. Parallel determinations of the potency were also made.

The potency of the coagulant is most easily and accurately ascertained by measuring the effect of a known quantity of the tissue fibrinogen in accelerating the clotting time of citrated horse plasma which has been recalcified.

Five-hundredths of 1 per cent. of sodium citrate is added to freshly drawn horse blood to prevent coagulation. This is then freed from corpuscles by centrifuging. One cc. of this citrated plasma is placed in a 10-cc. test-tube. This is put into a water-bath, maintained at a temperature of 40° C. until the contents of the tube reach that temperature. Five-hundredths of one cc. of the coagulant under examination is now added and mixed thoroughly. The quantity of 1% solution of calcium chloride required for coagulation (the quantity required for this

* Scientific Section A. Ph. A., Asheville meeting, 1923.

particular plasma having been previously determined) is then added, mixed thoroughly and the test-tube replaced in the water-bath. The time elapsing between the addition of the calcium chloride solution and the formation of a solid clot (as recorded by a stop watch) is noted as the clotting time of this sample.

Comparison of the clotting time cannot be made except when the same lot of plasma is used and used on the same day, for the age of the plasma affects the results. Therefore to compare the relative potency of different lots of coagulant it is necessary to ascertain the normal clotting time of each lot of plasma used and to use this normal clotting time as a factor in establishing the degree of potency.

Below are given the results, in minutes, observed with one specimen of tissue fibrinogen when tested on plasma on the first, twelfth and fortieth days:

	1st day.	12th day.	40th day.
Clotting time with tissue extract	0.61	0.70	0.83
Normal clotting time	3.25	3.79	4.40

By dividing the smaller figure by the larger we get what I have termed the "clotting quotient" which furnishes directly comparative figures. In these examples the clotting quotient for the first day is 0.1877, for the twelfth day 0.1844, and for the fortieth day 0.1886. This shows that there was no material change in the efficacy of the coagulant during the forty days although the elapsed time in each operation differed. The "clotting quotients" ascertained before and after the addition of preservatives are comparable in the same way. In reading the results it must be borne in mind of course that the smaller the fraction the greater the activity of the coagulant.

EFFECT OF ADDITION OF CHEMICAL ANTISEPTICS.

Tricresol.—Tricresol because of its prominence in this field of work was first studied.

Solutions containing 0.3% tricresol were placed in a refrigerator at 34–40° F. immediately after the addition of the tricresol. Subsequent culturing showed that the solutions had not been sterilized as they still contained spore bearing, rod-shaped bacilli. When incubated for several days immediately after the addition of tricresol a sterile solution resulted. Probably the difference of action is due to the fact that the tricresol acts on the fully developed organisms but not on the spores. However, the activity of the extract was greatly reduced.

Clotting quotient before adding tricresol = 0.090
Clotting quotient 4 days later = 0.122
Clotting quotient 7 days later = 0.180
This shows a loss of 50% activity in about one week.

Acriflavine.—A series of tests with acriflavine in dilutions of 1:1000, 1:2000, 1:5000, 1:10,000, 1:20,000 and 1:40,000, both in neutral and slightly alkaline (p_H = 9.0) solutions of tissue fibrinogen were made. In none of these was sterility obtained and the potency diminished in proportion to the amount of acriflavine present. Also those made slightly alkaline depreciated in potency more rapidly than those left neutral.

Sodium Nitrate, Sodium Nitrite, Sodium Benzoate and Borax.—Similar experiments were tried with these salts. All prevented putrefaction for a considerable time but in no case was complete sterility obtained. In moderate strength, 1:1000,

the effect on the activity was very slight but in more concentrated solution the activity was cut down in proportion to the quantity of chemical added.

Chlorine Compounds.—With the chlorine compounds, as chloramine T., chloretone and chloroform, it was found that complete sterility was obtained only with chloramine T. and then only in a concentration greater than 1:500. At this concentration the activity was decreased 60% in a week's time. With the chloroform and chloretone the loss of activity was not so great but they were not capable of sterilizing the solution.

Mercury chrome 220 and chinosol were tried with similar unsuccessful results.

After these results chemical sterilization seemed out of the question and two attempts along physical lines were made.

Freezing.—The extract in ampuls was subjected to a temperature of −45° C. to −50° C. for 10 minutes on 3 consecutive days. The activity was in no way impaired by this procedure but the spore-bearing organisms were not killed.

Pressure.—An old method of sterilizing by CO_2 under pressure was also tried. The extract was subjected to a pressure in an autoclave of 400 lbs. per square inch for 24 hours. This did not impair the activity of the extract nor did it sterilize it as was shown by subsequent cultures.

Mercuric Chloride.—Mills (3) furnished a method about this time (1922) which later gave very satisfactory results. The method, although no single step is new, is novel in the combination of steps.

It consists of the sterilization of the extract with bichloride of mercury. This is known to be an active sterilizing agent. Even anthrax spores are readily destroyed by it in a comparatively short time.

However, the mercuric chloride is toxic to the higher forms of life and so must be completely removed before the solution can be safely injected subcutaneously.

To accomplish this end the finished extract is placed in a dialyzer and mercuric chloride solution added to 1:500 concentration. This is allowed to stand for 4 hours, care being taken that the solution comes in contact with all parts of the interior of the dialyzer. Twelve per cent. of sterile sodium chloride is then added. This serves to dissolve the mercury protein precipitate with the formation of a soluble sodium proteinate and re-formation of mercuric chloride. After allowing to stand for several hours to complete the solution it is placed in a dialyzer against water to which strips of bright copper are added. As the mercuric salt passes through the dialyzer it is replaced from solution by the copper, thus rendering the process irreversible. Inasmuch as the sodium chloride passes out along with the mercuric salt it quite often happens that the protein again combines with any mercuric salt which may remain in the dialyzer. In such case it is necessary to resalt to about 12% and repeat the dialyzing process against water and copper. Where it is desired to use the resultant extract for subcutaneous injection it is advisable to finally dialyze against a known volume of water which will give a 0.9% solution of salt when equilibrium has been reached. The removal of the mercury is quantitative, for after destroying the organic matter there will be less than one milligram deposited on a gold electrode from a 25-cc. sample.

The resulting extract is in every way as active as it was before sterilization. No diminution in the acceleration of the clotting time of plasma could be detected and complete sterility is effected in every case.

While we have used this method of sterilization only in tissue fibrinogen it offers very interesting possibilities in the ever-growing field of protein preparations for injection because we are able by it to obtain a sterile product without permanently affecting its nature.

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BIOCHEMICAL LABORATORIES
OF THE WM. S. MERRELL CO.,
CINCINNATI, OHIO.

ABSTRACT OF DISCUSSION.

The author was asked if the mercuric bichloride left in the solution would be sufficient to sterilize the product. The author replied that this was impossible for the concentration of mercuric chloride in the finished product was only 1 in 25,000 while 1 to 800 is a minimum quantity to affect the sterilization of anthrax bacillus.

The author was further asked whether the method had been applied to vaccines. In answer thereto he said that it offered a very interesting possibility for the sterilization of vaccines without heat, but he had not completed experimentation and, therefore, was not in position to give a definite answer.

PNEUMOCOCCUS ANTIBODY SOLUTION.*

With Special Reference to Its Nature, Preparation, Administration and Effect.

BY PAUL S. PITTENGER.

Antibody solutions are a new classification of biologic products just beginning to come into use.

Their importance cannot be overestimated as clinical data (1, 2, 3) already indicate that Pneumococcus Antibody Solution will no doubt prove to be the greatest discovery in the biologic field since the discovery of Diphtheria Antitoxin.

Immediately following the discovery of Diphtheria Antitoxin and publication of clinical data showing the remarkable reduction in mortality as a result of its use, pharmacists were called upon by physician and layman alike for all kinds of information in reference to its nature, preparation, administration and effect.

Clinical data have already been published by competent clinicians (1) showing that the lobar pneumonia mortality has been reduced to one-half the usual rate in cases receiving early treatment with Pneumococcus Antibody Solution.

It is to be expected, therefore, that we as pharmacists will within the near future be called upon to supply this new product and give information in reference to it.

In view of the fact that few physicians or pharmacists are as yet familiar with this latest classification of biologic products, I thought that a paper on *Antibody Solutions* would be acceptable at this time.

Pneumococcus Antibody Solution is the first of these solutions to be successfully produced on a manufacturing scale. I will therefore confine my remarks to a description of this product.

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* Scientific Section, A. Ph. A., Asheville meeting, 1923.

NATURE OF PNEUMOCOCCUS ANTIBODY SOLUTIONS.

The nature of Pneumococcus Antibody Solution can be best described by showing how it differs from Antipneumococcic Serum.

Antipneumococcic Serum is prepared by injecting horses intravenously with emulsions of killed Pneumococci, Types I, II, III, in gradually increasing doses until the horse establishes a very high degree of immunity, and it can be demonstrated by laboratory tests that there are considerable quantities of antibodies existing in the horse's blood.

It is then possible to start injecting the horse with infinitesimally small doses of living organisms of the same kind and types. These quantities can be gradually increased as the immunity is increased. Injections are continued during a period of several months after which the horse is said to be hyper-immune and is ready to be bled.

Approximately 50% of the horse's blood is serum which contains antibodies. This serum is tested for potency both by laboratory and animal tests.

When the serum is of such potency that it will protect a white mouse against one billion fatal doses of pneumococcus, it is generally held the serum has a titer sufficiently high to be of therapeutic value.

A small quantity of preservative is added and the serum sterilized by passing through Berkfeldt filter.

Although Antipneumococcic Serum can be made of such strength that it protects against one billion fatal doses of the pneumococcus, and is therefore a valuable agent in the treatment of pneumonia, it has certain disadvantages. The principal objection to the serum is the fact that it contains large quantities of horse protein and may therefore produce serum sickness or sensitize the patient so that subsequent serum injections are liable to occasionally produce anaphylaxis.

In Antipneumococcic Serum the serum itself is of a colloidal nature, and the protein is of little or no therapeutic value.

The serum merely acts as a menstruum for carrying the specific antibodies.

Pneumococcus Antibody Solution.—In an endeavor to get rid of the objectionable serum, biologic chemists have for years tried to separate the antibodies from the serum.

This separation was first accomplished on a successful manufacturing scale four years ago by Dr. F. M. Huntoon of the Mulford Laboratories. Huntoon's proctocols were published in the *Jour. of Immunology*, 6, 117, March 1921.

This separation was accomplished by a very ingenious procedure based upon the fact that if killed pneumococci are added to Antipneumococcic Serum, the antibodies in the serum will become attached to, or absorbed by the killed bacteria.

The bacteria with the contained antibodies can then be removed and washed free from serum, after which the antibodies themselves can be redissolved in water and separated from the dead bacteria, thus leaving a water solution of the antibodies containing only about 0.035 mg. of nitrogen per cc.

Pneumococcus Antibody Solution is therefore an aqueous solution of pneumococcus antibodies having the same protective value as the serum, but is practically free from all serum proteins and solids.

It is practically permanent in appearance and is of the color and density of distilled water.

The nature of this solution was described in a recent paper by Drs. Cecil and Larsen (2) as follows:

"The advantages of this preparation (Pneumococcus Antibody Solution) are:

"1. It is polyvalent; that is, it is aimed against the three fixed types of pneumococcus; and according to our figures, it has also shown itself to be of distinct value in the Type IV pneumonia. By reason of its polyvalent character, typing of the sputum is no longer absolutely necessary, and treatment of the patient can be instituted as soon as the diagnosis of Lobar Pneumonia has been made. This of course is of great advantage over serum."

"2. Pneumococcus Antibody Solution is practically free from horse protein, hence there is no danger of anaphylaxis or serum sickness. This removes a great source of worry for the physician and discomfort to the patient and there is therefore no reasonable limit to the amount of antibody solution that can be administered."

PREPARATION OF PNEUMOCOCCUS ANTIBODY SOLUTION.

The principle involved in the method of manufacturing this solution follows:

1. The antibodies are in suspension in the Antipneumococcic Serum.

2. Killed pneumococci are added to the serum and the antibodies are absorbed by the killed bacteria. In other words, we have a combination of antibodies with antigen (killed bacteria).

3. The antibody-antigen combination is then broken up by suspending the combination in salt solution, from which the killed bacteria are removed, allowing the antibodies to remain in suspension.

4. The antibody solutions are then sterilized by filtration and supplied without preservative, after it has been shown that the antibody solutions are equal in potency to the serum.

It will be noted, therefore, that if a serum is prepared by immunizing a horse with emulsions of Types I, II, III Pneumococci, an antibody solution can be prepared from this serum which will be practically serum-free and have the same protective value as the original serum from which it is prepared.

ADMINISTRATION OF PNEUMOCOCCUS ANTIBODY SOLUTION.

In the first clinical tests the solution was administered *intravenously*.

The results obtained in over four hundred cases treated by intravenous injection are reported in a paper by Drs. Cecil and Larsen (1) of one hundred and three cases in a paper by Dr. Connor (3).

It was found, however, that the intravenous injection was usually followed by rather severe general reactions.

Later investigations by Dr. Cecil have shown that equally good results can be obtained by *subcutaneous injection* without the severe reaction.

The subcutaneous method of administration is, therefore, to be preferred because this method has produced no untoward effects other than a mild local reaction.

The solution is promptly absorbed and can be administered to infants as well as aged patients.

Dosage.—The initial dose in mild cases is 50 cc. to 100 cc. subcutaneously; in severe cases, 100 cc. to 300 cc. Two doses are usually given the first day, from eight to twelve hours apart. This is usually followed by one or two doses on subsequent days according to the severity of symptoms.

As the solution is practically serum-free there is no danger of serum sickness

or anaphylaxis and as much as 1000 cc. have been administered to one patient within 24 hours.

There are apparently no contraindications as very sick patients have been treated with over 1000 cc. within 24 hours.

EFFECTS OF PNEUMOCOCCUS ANTIBODY SOLUTION.

The therapeutic efficacy of Pneumococcus Antibody Solution has been tested clinically in the wards of the Bellevue Hospital, New York, and the New York Hospital. These tests were carried out in comparison with the older methods of treating pneumonia as controls. In Bellevue Hospital the work was conducted by Dr. Russell L. Cecil and Dr. Nils P. Larsen. They were under the supervision of coöperative arrangement between Bellevue Hospital, the Influenza Commission appointed by the Metropolitan Life Insurance Co. at the suggestion of its vice-president, Dr. Leo. Frankel, Cornell University Medical College working in co-operation with the Hospital and the Mulford Co.

The preliminary results of the clinical study made by Drs. Cecil and Larsen have been published in the *Jour. A. M. A.* (1) and in a paper read before the Philadelphia College of Physicians and published in the *Weekly Roster and Medical Digest* (2).

A few abstracts from the latter paper by Dr. Cecil follow:

TABLE I.

"Comparison of Death Rate in Treated and Control Series.

	Cases treated with antibody.			Control cases.		
Type.	Cases.	Deaths.	Rate %.	Cases.	Deaths.	Rate %.
Pn 1.....	157	21	13.4	175	41	23.4
Pn 2.....	78	22	28.2	76	31	40.7
Pn 3.....	57	20	35	60	24	40
Pn 4.....	109	17	15.6	137	31	22.8
Total.....	401	80	19.9	448	127	28.3
Strep. Hemo.....	21	10	47.6	21	9	42.8
Strep. Vir.....	7	1	14.2	10	1	10

"The results of treatment with antibody were much more striking in cases that were treated early in the disease. For example, in Table II it will be noticed that the death rate for Type I, pneumonias treated during the first 48 hours of the

TABLE II.

"Death Rates for Pneumococcus Pneumonias Receiving Antibody on or before Third Day of Disease. Control Shows Death Rate for Pneumococcus Pneumonias Admitted to Control Wards on or before Third Day of Disease.

	Cases treated with antibody.			Control cases.		
Type.	Cases.	Deaths.	Rate %.	Cases.	Deaths.	Rate %.
Pn 1.....	56	5	8.9	68	16	23.5
Pn 2.....	24	5	20.8	25	8	32
Pn 3.....	10	1	10	19	7	36.8
Total.....	90	11	Ave. 12.2	112	31	Ave. 27.6
Pn IV.....	24	4	16.6	45	11	24.4
Total.....	114	15	Ave. 13.1	157	42	Ave. 26.7

disease, was only 8.9 per cent., while controls admitted to the hospital during the first 48 hours of the disease showed a death rate of 23 per cent. Similar reductions are noticed in the other types. Altogether 114 pneumococcus pneumonias treated with antibody during the first 48 hours of the disease showed a death rate

of only 13.1 per cent., whereas 157 pneumococcus pneumonias in the control series ran a death rate of 26.7 per cent., practically twice as high."

The published clinical data show that Pneumococcus Antibody Solutions are specific in the treatment of all types of pneumococcus pneumonia, but without effect in streptococcus or B. Friedlander pneumonias.

Dr. Cecil states that "Upon the evidence which has been presented we must conclude that Pneumococcus Antibody Solution is a therapeutic agent of considerable power. The effect is most striking when the antibody is administered early in the disease, but it may also be of value in the later stages by neutralizing the circulating toxins."

Antibody solutions have for the past two years been supplied to the leading pneumonia specialists throughout the United States for clinical study. The satisfactory results obtained by these specialists as shown by the above abstracts indicate that antibody solutions mark an important step in advance in the specific treatment of lobar pneumonia.

It is quite possible that other antibody solutions will be developed in the near future and it is to be expected therefore that within the near future we as pharmacists will be called upon to supply antibody solutions.

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RESEARCH LABORATORY,
H. K. MULFORD COMPANY,
PHILADELPHIA, PA.

ABSTRACT OF DISCUSSION.

A MEMBER: I would like to ask whether it would not be possible to find some absorbent for the antibodies, other than bacteria.

MR. PITTENGER: No other means have been found.

MR. SNYDER: There has been an unlimited amount of work done in this direction but I believe that this is the only workable method that has been discovered.

MR. KEBLER: Some very interesting things have been brought out in this paper which may eventually prove to be of great value to the medical profession, but I wish to caution the members against becoming over-enthusiastic. The matter of antibodies is not as yet thoroughly understood. I would therefore like to call attention to the unfortunate conclusions that are frequently made by men who are in this line of work.

I do not think that these men would deliberately make misstatements in regard to a discovery, but the trouble lies in the fact that they become absolutely enthusiastic over their subject and over-estimate the possibilities of what they have discovered. I do not want to criticize Dr. Pittenger, but it is the idea that I wish to emphasize.

A few years ago there was a great deal of work done and talk on the treatment of pneumonia with anti-pneumococcic serum. Dr. McCoy has told me that although they have gone into the subject very thoroughly and used the serum intravenously and intramuscularly, on a large number of cases they found the treatment to have very little merit or advantage over other methods.

We have all seen cases, conspicuous indeed, many of them, where men have gone astray, not wittingly but unwittingly, and I just want to add a word of caution about making assertions that later may be shown to be absolutely inaccurate.

MR. PITTENGER: In answer to Dr. Kebler, I would like to say that just for the particular

reason which he has so fully brought out, the investigation of the clinical value of Pneumococcus Antibody Solution was turned over to an absolutely disinterested commission.

This work was carried out in the wards of the Bellevue Hospital, New York, and the New York Hospital. The tests were under the supervision of the Influenza Commission consisting of Drs. Roseneau, Parke, McCoy, Frost, Jordan, Cecil, Frankel and Knight, with coöperative arrangement with Cornell Medical College, Metropolitan Life Insurance Co. and the Mulford Co.

In Bellevue Hospital the work was conducted by Dr. Cecil and laboratory attachés of U. S. Hygienic Laboratory.

I think this is probably the first instance in which a scientific discovery was turned over to such a commission with Government coöperation and investigation as to its clinical value.

We realize the fact that by selecting the cases, unusually favorable results may be obtained. In this investigation, however, the physicians in the hospital did not select their patients.

Arrangements were made for proper controls, that is to say, every other patient regardless of condition would be treated with Pneumococcus Antibody Solution, while alternate patients would receive the best known treatment without antibodies. As a result of this the data include patients received in the hospital in all stages of the disease.

In addition to the above hospitals, the serum has been furnished to pneumonia specialists in many of the large cities, and to hospitals throughout the United States. The results of these clinical tests are to be published.

Although we have had hundreds of requests for Antibody Solution it has not as yet been placed on the market for sale.

I can appreciate Dr. Kebler's point in view of the remarks of one of the Cleveland specialists who described a treatment for pneumonia which had given him wonderful results one season and was practically of no value the following season.

This investigation is, therefore, in the hands of our most eminent specialists and all data have been subject to control cases.

No statements will be made for this product that do not come from these specialists regarding its clinical value.

AN ADULTERANT OF QUEEN-OF-THE-MEADOW.*

BY OLIVER ATKINS FARWELL.

This drug is the herb, or, to speak more accurately, the leaves and flowering tops of *Eupatorium maculatum* Linn. In pharmaceutical literature it passes under the nomenclatorial name of *Eupatorium purpureum* Linn probably because when this name was adopted, *E. maculatum* had been reduced by botanists in general to a synonym of *E. purpureum* The leaves of *E. purpureum* are thin and even, not rugose, the stems are glabrous or whitish puberulent at the summit and the flowers are whitish or pale pink. In *E. maculatum* the leaves are thick and prominently rugose, the stems at the summit are densely glandular pubescent and the flowers are rose-purple. It is probable that both species enter into the make-up of the drug as found upon the market, but it has been my experience to find that it is mostly *E. maculata*. In general, this drug is very free from adulteration. Some lots of recent collection have been found to contain as much as 20% of Ironweed, *Vernonia Noveboracensis* Willd. It would be a difficult matter to say if it were an intentional adulteration. But the two plants are so unlike in the living state that it needs must stretch one's credulity to the limit to believe that the adulteration was accidental. If well spread out and mixed up with the genuine drug, the Ironweed might go undetected except through the closest scrutiny.

DEPARTMENT OF BOTANY,
PARKE, DAVIS & COMPANY, DETROIT, MICH.

* Scientific Section, A. Ph. A., Asheville meeting, 1923.

THE MICROSCOPICAL IDENTIFICATION OF SOME SODIUM AND POTASSIUM SALTS.

BY GEO. L. KEENAN.

Some sodium and potassium salts in admixture are often difficult to identify chemically when two or more acid radicals are present. For example, in a chemical examination of a mixture of potassium chloride and sodium nitrate, it is a simple matter to identify nitrates, chlorides, sodium, and potassium, but these results do not furnish any information as to the combination of the sodium and potassium with the acid radicals that might be present. To overcome this difficulty it has seemed worth while to outline a method of procedure for the microscopical identification of five of these salts commonly met in food and drug analysis—sodium chloride (NaCl), potassium chloride (KCl), potassium nitrate (KNO_3), sodium nitrate ($NaNO_3$), and potassium and sodium tartrate (Rochelle salt, $KNaC_4H_4O_6 \cdot 4H_2O$).

In describing the method it is taken for granted that the analyst has a microscope equipped with the lenses commonly furnished with such an instrument, a rotary stage, and a micro-polariscope. The most common form of the micro-polariscope consists of two nicol prisms, the analyzer and the polarizer. The polarizer is placed in the diaphragm carrier which swings out from under the condenser beneath the microscope stage. The analyzer is placed at some level above the object, often above the ocular, or it may consist of a combination ocular-analyzer in which case it replaces the ordinary ocular in the tube.

In addition to the microscope and micro-polariscope, five oily liquids of known refractive index are necessary. These may consist of single oils or of mixtures, the index of refraction of which must be determined by a refractometer and, if not of the desired value, must be brought to that point by mixing in small quantities of one or the other of the oils.

1. Refractive index 1.488 = Squibb's mineral oil.
2. Refractive index 1.495 = toluene or a mixture of mineral oil and clove oil.
3. Refractive index 1.505 = sandalwood oil or a mixture of clove oil and mineral oil.
4. Refractive index 1.545 = clove oil or a mixture of mineral oil and monochlornaphthalene.
5. Refractive index 1.585 = aniline or a mixture of mineral oil and monochlornaphthalene.

DIAGNOSTIC OPTICAL PROPERTIES.

Sodium chloride and potassium chloride crystallize in the isometric (cubic) system and therefore exhibit no change from light to dark when the microscope stage is rotated with nicols crossed (dark field). Each of these salts possesses but one refractive index which is significant in establishing the identity of the substance. The index of refraction characteristic of sodium chloride is 1.544 and that characteristic of potassium chloride is 1.490. Potassium nitrate, sodium nitrate, and potassium and sodium tartrate, on the other hand, exhibit changes from light to dark when the stage is rotated with the nicols crossed, *i. e.*, they are doubly refractive and also possess two or three significant refractive index values which make possible their identification. The identification of potassium nitrate is easily

accomplished by reason of the fact that a mean value of the two higher refractive indices, approximating 1.505, is shown so frequently that it becomes of diagnostic importance in practical analytical work. The intermediate index significant for potassium and sodium tartrate is 1.495 and the index value diagnostic for sodium nitrate is 1.587.

PROCEDURE.

(*a*) A small quantity of the crystalline material is crushed on a microscope slide, a drop of the liquid with $n = 1.505$ is added, and the cover-glass is applied. The preparation is transferred to the microscope stage and examined in the dark field formed by crossing the nicol prisms (analyzer and polarizer). If the crystal fragments exhibit no change from light to dark when the stage is rotated with nicols crossed, the substance in question must crystallize in the isometric system and may be either sodium chloride or potassium chloride. On the other hand, the fragments may become alternately dark and light when the stage is rotated with crossed nicols. In this instance sodium nitrate, potassium nitrate, or potassium and sodium tartrate may be sought.

(*b*) The preparation is next examined in ordinary polarized light. To do this replace the analyzer with the ocular, leave the polarizer in position, and slightly close the substage diaphragm. If the first examination with crossed nicols has shown that the substance is isometric, some indication as to whether it is sodium chloride or potassium chloride may be gained from the behavior of these fragments when the microscope tube is slightly raised. A band of light will pass from the liquid into the crystal fragment if the refractive index of the substance is higher than that of the liquid; or conversely, the band of light will pass from the crystal into the liquid if the liquid has a higher index of refraction than the crystalline material. This test will determine whether the substance has a refractive index value approaching that of either sodium chloride or potassium chloride. If the first examination with crossed nicols has shown that the substance is not isometric but the fragments become alternately light and dark when the stage is rotated, there is a possibility that the substance may be potassium nitrate, sodium nitrate, or potassium and sodium tartrate, confirmation of any of which can be made according to the following directions:

CONFIRMATION OF SODIUM CHLORIDE.
($n_D = 1.544$)

Since the preliminary tests already described have indicated that the substance examined was isometric and had an index of refraction higher than the liquid, 1.505, a preparation is made by crushing a small quantity of the material and mounting it in a drop of the liquid having a refractive index of 1.545.[1] Examining the preparation in ordinary light shows that the identity of the crystal fragments has been practically lost in the liquid. The definite outlines of the fragments have disappeared, but most of these fragments have yellow and bluish bands of light surrounding them, and nearly every one has its central portion characterized by dark bordered pockets of air. In other words, the phenomena described indicate that

[1] Isometric substances, not being doubly refractive, must be examined in liquids slightly higher or lower than the diagnostic index in order to be visible.

the refractive index of the substance, sodium chloride, has been approximately matched against that of the liquid and the substance definitely identified.

CONFIRMATION OF POTASSIUM CHLORIDE.

($n_D = 1.490$)

If examination of the unknown isometric substance in liquid with refractive index of 1.505 has shown that the substance has a refractive index decidedly lower than that of the liquid, *i. e.*, a band of light is seen to pass out from each fragment into the liquid as the tube is raised, then a fresh portion of the material should be crushed and mounted in a drop of the liquid having an index of refraction of 1.488. If the substance in question is potassium chloride, the identity of the fragments will be lost when mounted in this liquid. The location of the fragments is established only by the yellow and blue bands surrounding some of them and by the inclusion of air in the interior of the fragments.

CONFIRMATION OF POTASSIUM NITRATE.

($n_\alpha = 1.335$, $n_\beta = 1.505$, $n_\gamma = 1.506$)

It is a simple matter to identify the substance as potassium nitrate when it is mounted in the liquid with a refractive index of 1.505. On rotating the stage (using ordinary polarized light) the eye is attracted by the large number of fragments which completely lose their identity in some position in the field, the margins of the fragments disappearing as though substance had gone into solution. In other words, mean values of the refractive index approaching that of the liquid, 1.505, occur so frequently in the substance that no difficulty whatever is encountered in confirming the identity of the material as potassium nitrate. The fragments have then been approximately matched against the refractive index of the liquid, 1.505, which is diagnostic for this substance.

CONFIRMATION OF SODIUM NITRATE.

($n_\omega = 1.587$, $n_\epsilon = 1.336$)

The presence of sodium nitrate may be substantiated by mounting the material in a drop of the liquid having a refractive index of 1.585. The margins of most of the fragments practically disappear in some position in this liquid when the stage is rotated (using ordinary polarized light). This liquid is diagnostic for the substance and makes it possible to establish its presence without difficulty.

CONFIRMATION OF POTASSIUM AND SODIUM TARTRATE.

($n_\alpha = 1.492$, $n_\beta = 1.493$, $n_\gamma = 1.496$)

The presence of potassium and sodium tartrate is confirmed by mounting the crystalline material in a drop of liquid having an index of refraction of 1.495. This refractive index value occurs so frequently in the material that it is easily matched and therefore of value in establishing the identity of the substance.

TABLE OF DIAGNOSTIC REFRACTIVE INDICES.

Substance.	Diagnostic refractive index.
Potassium chloride	1.490
Potassium and sodium tartrate	1.493
Potassium nitrate	1.505
Sodium chloride	1.544
Sodium nitrate	1.587

SUMMARY.

A practical working outline for the microscopical identification of potassium chloride, potassium and sodium tartrate, potassium nitrate, sodium chloride and sodium nitrate has been devised. The identification is based on the fact that these substances have significant refractive indices which are important in identifying small quantities of material in practical analytical work.

MICROCHEMICAL LABORATORY,
BUREAU OF CHEMISTRY,
WASHINGTON, D. C.

AN IMPROVED METHOD FOR THE ASSAY OF MERCURIAL OINTMENT U. S. P. AND BLUE OINTMENT U. S. P.*

BY D. M. COPLEY.

The present official method for the assay of Mercurial Ointment and Blue Ointment, while accurate and reliable in itself, is not well suited for use in a Control Laboratory, where time is an important factor and where several lots may be held in process awaiting a chemist's report. At best, it is a time-consuming operation, and in the hands of one not thoroughly experienced with the method there is considerable chance for error. Chemists who are not well versed in the method frequently lose mercury in decanting the benzin and also have trouble collecting all the mercury in a globule while in the hydrochloric acid solution.

As this Laboratory has a large number of samples of both Mercurial and Blue Ointments to assay a modification of the official method was sought which would be more rapid and also require less experience for its satisfactory use.

The official assay at present reads as follows:

> Mercurial Ointment.—Weigh 10 Gm. of Mercurial Ointment in a tared dish, melt it, then remove it from the fire and add 50 mils of warm purified petroleum benzin. Stir the mixture well, allow the mercury to settle completely, and decant the benzin. Wash the residue with successive portions of 10 mils each of warm purified petroleum benzin until it is entirely free from fatty matter, carefully retaining all of the separated mercury in the dish, and allowing all traces of the benzin to evaporate. Add to the residue 10 mils of diluted hydrochloric acid, heat it gently and stir with a glass rod until the mercury collects in a globule. Pour off the acid, warm the mercury with a little distilled water, dry the globule on bibulous paper, and weigh. The separated mercury weighs not less than 4.9 Gm. nor more than 5.1 Gm.
>
> Blue Ointment.—Proceed as directed in the assay under Mercurial Ointment. The separated mercury weighs not less than 2.9 Gm. nor more than 3.1 Gm.

In examining this method for possible improvement purified petroleum benzin was not thought to be the ideal solvent. The prepared suet, and yellow wax used during hot weather in order to stiffen the ointment, are very slowly soluble in this solvent in the cold; and it is unwise to warm the mixture since the benzin begins to boil at 40 deg. C. with considerable bumping and spattering, often resulting in mechanical loss of mercury. Also considerable time is required for a complete separation of the residue containing the mercury and the solvent and in this Laboratory any saving of time in this assay is important.

After trying various solvents it was found that ether had a distinct advantage

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* Scientific Section, A. Ph. A., Asheville meeting, 1923.

over petroleum benzin. The fats and wax are more readily soluble in the cold, and the separation takes place much more rapidly.

Among other solvents tried xylol showed promise of being of value as it could be warmed above the melting point of the fats and wax in the ointments without boiling or spattering, and thus effect complete solubility almost at once. However, when applied to the ointments without first removing some of the fats, the separation was as slow as when benzin was used, with no saving in time. When used, however, after most of the fats had been removed with ether, it was most effective in producing a practically fat-free mercury residue. Since the xylol cannot be removed from the mercury residue at ordinary temperatures, it was found necessary to remove the small amount remaining after decantation with a further washing of ether. If anhydrous ether has not been used, the xylol will sometimes cause a few drops of water to collect on the surface of the mercury. This can be readily removed by a single washing with ten or fifteen cc. of alcohol.

By using these solvents the treatment with dilute hydrochloric acid is rendered entirely unnecessary. After the last ether washing to remove the excess xylol is completed, the mercury residue is dried with a gentle current of air and a few strokes with a rubber-tipped stirring rod serve to collect all of the mercury in a globule, leaving behind a slight dark gray residue of mercury oleate. In case any of the mercury oleate adheres to the globule of pure mercury, it can be easily brushed off with a camel's hair balance brush.

We have, therefore, developed a modification of the U. S. P. method for the assay of Mercurial Ointment and Blue Ointment which is more rapid and equally accurate.

Its accuracy has been proved by numerous comparisons with the official method upon the same sample of ointment and upon ointments made up in the Laboratory containing a known amount of mercury. The time-saving is considerable, since a complete assay can be run in a little less than an hour and while ordinary quantitative accuracy is necessary there need not be such extreme attention to detail as is required by the official method.

Stated briefly, the directions for using this method, which we call the "Ether-Xylol Method" are as follows:

Weigh ten grams of the ointment into a 100-cc. tall form beaker and warm gently to soften the mass and make it more easily workable. Add about 50 cc. of ether, anhydrous ether preferred, and stir until the mixture is uniform with no lumps of ointment remaining. Allow the mercury to separate and decant the ether as closely as possible without losing any of the mercury. Repeat the washing with another 50 cc. of ether and decant as closely as possible. Now add about 50 cc. of xylol and heat on the steam-bath to about 80 deg. C. with stirring. Allow to stand at this temperature for five minutes, or until all of the mercury has separated, and decant the xylol as closely as possible. If any moisture is present in the mercury residue wash it out with a single washing of 10 or 15 cc. of alcohol. Finally wash again with 50 cc. of ether to remove the excess xylol and alcohol and dry the mercury residue in a stream of air. Collect the mercury in a globule by rubbing gently with a rubber tipped stirring rod. If any particles of Mercury Oleate adhere to the mercury globule, brush them off with a camel's hair balance brush. The separated mercury, if from Mercurial Ointment, shall weigh not less than 4.9 Gm. nor more than 5.1 Gm., and if from Blue Ointment shall weigh not less than 2.9 Gm. nor more than 3.1 Gm.

Analytical Laboratory,
The Norwich Pharmacal Company.

HYPOCHLORITE SOLUTIONS.

BY RUTH M. DAVIS AND H. A. LANGENHAN.

(*Continued from p. 34, January* JOURNAL A. PH. A.)

(NO. 2.) LABARRAQUE'S ORIGINAL FORMULA AND MODIFICATIONS OF THIS.

Of the many hypochlorites known to the chemical world, the one of chief interest to the pharmacist is sodium hypochlorite, because it has become of greatest importance in pharmacy and medicine. Interest in this hypochlorite has, since the date of its discovery, gradually increased until it reached its height during the past war, as this substance was found to be an antiseptic of great value. Its introduction in the form of the "new antiseptic" served as a stimulus for more extended research on the chemistry and therapeutics of aqueous hypochlorite solutions and to the introduction of new types of chlorine antiseptics. This fact is emphasized in a recent editorial in the *American Journal of Pharmacy*, as follows:

"When Dakin and Carrel consummated the great discovery that gave surgery and the world the now famous 'Dakin's Solution' they little knew that their invention was to inaugurate a germicidal fad that has since formed a profusion of chlorine containing compounds into an already bulging materia medica."

Although much time and energy have been allotted to *Labarraque's Disinfecting Fluid* and to *Dakin's New Antiseptic Solution* the two are similar in composition, differing only in the alkalinity of the finished product and chlorine content, for Dakin's Solution is merely an outgrowth of *Labarraque's Original Bleaching Fluid.* Labarraque's formula as presented to the Academy of Sciences was as follows:

Chlorure d'oxide de sodium.	
Carbonate de soude pur	2 kil. 1/2
Eau distillee	10 kil.

Melez, et assurez-vous si la liqueur porte douze degrês au pésesel de Baume. Si la liqueur est trop concentrée, ce qui proviendrait du sel qui seroit effleuri, ajoutez-y la quantité d'eau nécessaire pour la porter au degré indiqué. Si au contraire la solution est trop faible, on ajoute du carbonate de soude en quantité suffisante.

Si le carbonate de soude reenoit constamment la même quantité d'eau, on n'aurait besoin que d'en fixer les doses précises; mais ce sel est loin d'être toujours indentique.

La liqueur est mise dans un flacon d'une contenance assez grande pour qu'l reste le quart environ de vide.

On dispose sue en bain de sable un ballon en verre de quatre pintes, á col allongé et a large ouverture, dens lequel on introduit le mélange suivant:

Hydrochlorate de soude	576 gram
Peroxide de manganèse pulverisé	448 gram

(La quantite de peroxide de manganèse serait trop considérable si cei-te substance se trouvait toujours de première qualité dans le commerce. Dans aucun cas, son excès ne me semble pouvoir être.)

On lute à l'embouchure du ballon un large tube recourbé et un tube en S pour l'introduction de l'acide affaibli. Le premier tube plonge dans un flacon contenant une petite quantite d'eau, et de ce flacon part un large tube recourbé qui plonge dans le flacon contenant la solution saline.

L'appareil convenablement disposé, et les lute bien secs, on verse dans le tube en S l'acide affaible froid, et mélange depuis quelques heures avec l'eau, dans les proportions suivantes:

Acide sulfuriqui concentré	576 gram
Eau	448 gram

On applique le beu sous le bain de sable, et on le dirige d'une maièrge graduelle, jusq'a ce que le dégagement du chlore cesse.

L'operation terminee, on délute l'appareil, et on examine la force decolorante du produit. On prend pour cela une partie du chlorure qu'on introduit dans le berthollimetere, et on verse dessus de la solution de sulfate de indigo preparee comme il suit:

Indigo du Bengal purvérisé	1 partie
Acide sulfurique concentre	6 partie

Faite agir á'chaud, et étendez ensuit dans neuf cent quatre-vingt-treize parties d'eau distillis.

Le chlorure doit décolorer dix-huit parties de sulfate d'indigo. Il est essential de faire deux ou trois épreuves de décoloration. Aprés la premiére, qu'on fait en tâtonnant, on doit faire la seconde brusquement, en ajoutant, en une seule fois, toute la quantité de solution de sulfate d'indigo que la prècédente épreuve aviait exigée, pour arriver à obtenir un vert fonce. En agissant avec promptitude, la decoloration est plus prononcée (ainsi que l'ont observé MM. Gay-Lussac et Velter); ce qui oblige à afire une troisième épreuve, après avoir ajouté quelques parries de sulfate d'indigo a la seconde, pour arriver à la couleur verte, et en tenant compte de cette addition dans la dernière experience, qui est la plus concluante.

Si la solution de carbonate de soude n'est pas assez saturée de chlore on doit y faire passer un courant de ce gaz, pour la ramener au point fixe.

Je suis entré ici dans des détails superflus, sans doute, pour des pharmaciens instruits; mais, quoique minutieux pour des chimistes execés, ces details m'ont paru indispensables dans la confection d'un medicament qui, jusqu'a ces derniers temps, m'avit pas eté employé en medicine. MM. les pharmaciens voudront bien suivre à la lettre le procéde qui vient d'être indiqué, afin d'obtenir toujours un produit indentique, et per cela même d'heureux resultats; car ils n'ignorent pas que, dans la préparation de certains médicamens, le mode opératoire en modifie les caractères extérieurs, et même les vertus.

In 1830 Durand offered the following English version of the formula for *Labarraque's Liquid*, published in the *American Journal of Pharmacy:*

Subcarbonate of soda (cryst.)	640 parts
Distilled water	2500 parts

If the solution is not saturated, add enough sodium carbonate to saturate it, but if the solution is supersaturated, dilute as required.

For chlorine gas:

Sodium chloride	147 parts
Manganese peroxide	112 parts

Acid mixture:

Sulphuric acid	147 parts
Water	112 parts

The nature of *Labarraque's Disinfecting Fluid* was carefully investigated by Faraday. He found that "chloride of soda" was the active principle of the compound and that its properties were considerably modified by the presence of carbonate of soda. Without changing the mode of operation prescribed by Labarraque he altered the proportion of ingredients in such manner so as to utilize all of the carbonate present, thereby obtaining a larger quantity of chlorine in the finished product. The formula is as follows:

Subcarbonate of soda	2800 grs.
Water	1.28 pts.
Sea salt	967 grs.
Manganese peroxide	750 grs.
Sulphuric acid	950 grs.
Water	50 grs.

Becoming interested in the action of chlorine on the subcarbonate solution, he saturated the latter with chlorine until carbon dioxide was given off. The

liquid obtained differed entirely in properties as compared with those of *Labarraque's Fluid*, as it "gave on standing chlorate of soda and common salt" while the latter contained "chlorine and pure soda."

At the same time that Faraday was working on his formula Payen prepared the sodium hypochlorite by double decomposition, using the following:

Chloride of lime	1 part
Water	12 parts
Carbonate of soda (cryst.)	2 parts
Water	4 parts

Cohen, in 1833, criticized this formula, saying: "It is impossible that Payen's process can produce *Labarraque's Liquid*, inasmuch as by the double decomposition ensuing, a portion of the carbonic acid is withdrawn from the soda in combination with the lime, and it is impossible to make a solution in this way, without containing a pretty large proportion of muriate and chlorate, independent of the fact that the solution can never be as concentrated as *Labarraque's Solution*." In spite of the adverse criticism, the revision committee for the 1840 U. S. Pharmacopœia introduced *Labarraque's Solution*, adopting the process of Payen, with the slight modification in parts of water used from sixteen to twelve.

For the next sixty years the development of the formula may be traced in the U. S. Pharmacopœia. The 1850 revision retained the formula unchanged. The 1860 and 1870 revision designated the quantities used in terms of ounces and pints in place of pounds and gallons, leaving the ratio unchanged, but, in 1880, there was a complete revision in the ratio of ingredients, *viz.:*

Chlorinated lime	100
Carbonate of soda	80
Water	1000

Up to this time the ratio of chlorinated lime to carbonate of soda was as one is to two. *Labarraque's Solution* was, from the first, known as strongly alkaline fluid. Faraday had attempted to completely neutralize the carbonate by increasing the amount of chlorine gas in the preparation of the solution. In the 1880 revision, a similar attempt was made by decreasing the amount of sodium carbonate and increasing the amount of chlorinated lime. This revision also increased the volume of the finished product and introduced a purity rubric, *viz.:* "there must be at least two per cent. available chlorine."

The 1890 revision again changed the formula. It returned to the use of the same proportions given by Payen, *viz.:*

Chlorinated lime (35% Cl)	75 Gm.
Carbonate of soda	150 Gm.
Water	1000 Gm.

This formula calls for twice as much sodium carbonate as chlorinated lime and also increases the requirement for available chlorine in chlorinated lime and in the finished product. This solution proved very unsatisfactory as it was almost impossible to obtain a chlorinated lime of the required strength, on the market, the strength varying considerably: For example, Arny and Dawson found a range of eleven to thirty-one per cent. of available chlorine in a series of samples they

analyzed. Solutions which they prepared from these contained on the average 1.8% available chlorine.

Hence the formula was again changed by the 1900 revision to:

Chlorinated lime (30% Cl)	90 Gm.
Sodium carbonate (monohyd.)	65 Gm.
Water	1000 Gm.
Purity rubric—avail. chlorine	2.4%

For the first time the quantities prescribed represent the approximate molecular equivalents necessary to form sodium hypochlorite. Originally the only guide controlling the amounts of ingredients used, was the reaction of the finished solution. Thus Labarraque specified, "pass chlorine into the carbonate solution until one part of the chloride will discolor eighteen parts of sulphate of indigo." In the earlier revisions of the U. S. P. the solution was supposed to "rapidly discolorize a solution of indigo." The 1880 revision introduced a purity rubric for the finished product, and the 1900 revision attempted to insure this purity rubric by properly proportioning the reacting ingredients. Theoretically this was an improvement, practically it failed to bring about the desired result. This was mainly due to the fact that little if any chlorinated lime was on the market having the required thirty per cent. available chlorine. The 1900 revision slightly increased the amount of sodium carbonate used, leaving the purity rubric for the chlorinated lime and finished solutions unchanged. No change was introduced by the 1910 revision. The formula was as follows:

Chlorinated lime (30% Cl)	100 Gm.
Sodium carbonate (monohyd.)	70 Gm.
Water	1000 Gm.
Available chlorine	2.5%

In an attempt to prepare a solution having the required chlorine content, Arny and Dawson increased the chlorinated lime, as compared with the U. S. P. amount, and collected only 900 cc. of filtrate. This gave a product of required strength.

Because of a demand made for a *Labarraque's Bleaching Fluid* containing five per cent. available chlorine, Elvove, in 1910, revived Graebe's process, which in turn was a modification of Labarraque's original method. Graebe, according to Elvove, found that upon using one part of chlorine to two parts of sodium hydroxide he obtained a product which deteriorated almost entirely in three days, but upon using two and one-half parts of sodium hydroxide the fluid obtained assayed 5.03% chlorine after standing six days; and that if three parts of sodium hydroxide were used the product assayed 5.37% at the end of twenty-three days.

The problem so far had been to obtain a standard solution with a limit in the amount of deterioration and, if possible, a method of preparation which could be used for both strong and weak solutions.

At the beginning of the world war a new field was opened. Before this the problem of sodium hypochlorite in antiseptiology had been given little consideration. *Labarraque's Solution* was objectionable for this purpose because of its strong alkalinity, which caused irritation when applied to wounds. Dilution was unsuccessful since this decreased the germicidal property in much greater proportion relatively than it did the alkalinity.

From the beginning of the war there was an increasing demand for an antiseptic easily prepared, easily applied, harmless, and producing successful sepsis in wounds. Thus the search for the perfect germicide inaugurated by Lister and Pasteur was revitalized. In 1915 Dakin of the Herter Laboratories, N. Y., then working in the Rockefeller Institute at Compeigne, produced the first formula containing materials to neutralize the excess alkali in *Labarraque's Solution, viz.:*

Sodium carbonate	140 Gm.
Water	10 liters
Chlorinated lime	200 Gm.
Boric acid	20–40 Gm. added

until a drop of the solution would not color powdered phenolphthalein when added to it.

Dr. Carrel used this "new antiseptic" in his clinical work. It did not prove as successful as hoped, for it was instable and variable as to chlorine content. This was probably due to the variability of the chlorinated lime which Dakin had neglected to assay before using. Moreover, the boric acid which was to have aided in the antiseptic action as well as to have neutralized the alkali proved almost as irritating as the caustic soda.

Consequently a modification of this formula was offered by Daufresne who was working under Carrel, *viz.:*

Chloride of lime (25% Cl)	184 Gm.
Sodium carbonate	92 Gm.
Sodium bicarbonate	76 Gm.
Water sufficient to give a solution which assays 0.5% available chlorine.	

This was simply a modified form of Labarraque's original formula in which "subcarbonate of soda and carbonate of soda" were used until a "saturated solution" was obtained. Furthermore in 1865 an article in the *Chemical News*, called attention to the use of sodium bicarbonate in place of the carbonate. Daufresne's modification was at once accepted and soon replaced the original Carrel-Dakin Solution. Very careful instructions as to requirement of finished solution and mode of preparation were formulated. It must assay from 0.45% to 0.5% available sodium hypochlorite and must not color powdered phenolphthalein. This solution was found to be quite stable lasting a week with very little loss and even six months without dropping below the 0.45% requirement. As soon as the "new" formula for this antiseptic was published, many articles appeared describing the solution, the technique of its preparation, and the many precautions to be observed.

This new idea having once been grasped by the pharmaceutical world, it took little time to produce results. The entire field of hypochlorites was invaded. Every acid radicle which would form an insoluble calcium salt was tried, as well as modifications of the boric acid and bicarbonate formulas of Dakin and Carrel.

The sulphate was one of the first to be introduced. In 1919 Ebert offered a formula substituting sodium sulphate for sodium carbonate, as follows:

Chlorinated lime	20 parts
Water	100 parts
Sodium sulphate	28 parts
Water	500 parts

The same year Cowley introduced a method for determining the per cent. soluble calcium salts present in a calcium hypochlorite solution, obtained by macerating chlorinated lime water in water. Based upon this, just enough sodium carbonate was added to exactly precipitate these salts. The procedure was as follows:

Take,

Chlorinated lime	50 Gm.
Water	500 mils
Filter and make up to	500 mils

Boil 20 mils of this solution with 10 mils dilute hydrochloric acid to expel chlorine, add normal sodium carbonate to neutralization, using methyl orange as indicator. Boil to expel carbon dioxide and again titrate, using phenolphthalein as indicator. From the number of mils used in the last titration the soluble calcium salts present in the 20 mils can be computed.

This method seems quite desirable but has been little used.

In 1920 two modifications of Daufresne's formula were published. One by an unsigned writer as follows:

Chlorinated lime	200 Gm.
Sodium carbonate	10 Gm.
Sodium bicarbonate	50 Gm.
Distilled water	10 liters

According to the writer, this produces a 0.5% solution of sodium hypochlorite. No statement was made concerning the alkalinity.

Ewe offered the other, an elaborate formula, in which calcium chloride is used to neutralize the excess sodium carbonate and slaked lime is added for the excess alkali necessary to stabilize the solution. The whole is then filtered. He states that a solution containing 4 or 5 per cent. available chlorine could be obtained by this method. The formula is as follows:

Chlorinated lime (32.5% Cl)	100 Gm.
Water	127 mils
Sodium carbonate (anhyd.)	40 Gm.
Sodium bicarbonate	41 Gm.
Water	379 mils
Calcium chloride	10 Gm.
Dry salked lime	5 Gm.
To make	240 mils

Thomas, in 1922, revived the old method of passing chlorine into aqueous solutions of alkalies. He used a decinormal solution of sodium hydroxide, and obtained a product containing 1.5% available chlorine with alkalinity about the same as that of the U. S. P. solution of chlorinated soda.

In 1923 Kelly and Krantz suggested the use of sodium phosphate:

Chlorinated lime	20 Gm.
Sodium phosphate	20 Gm.
Water	1000 mils

Produces a 0.5% available chlorine solution.

According to the authors the alkalinity of this solution was within the limits required by Dakin's specifications, but only a weak hypochlorite concentration could be obtained. A 0.5 per cent. solution, obtained by this process, was found to be as stable as other weak hypochlorite preparations.

Hypochlorite solutions used for disinfecting water supplies, bathing tanks, streets, and in laundries to destroy microörganisms and to remove stains, are made on a large scale by the electrolytic process. A 4 per cent. solution of sodium chloride in water when treated with 10 amperes direct current at 220 volts, can produce twelve gallons of sodium hypochlorite solution of 2 per cent. strength in one hour. (For references see list following No. 3.)

UNIVERSITY OF WASHINGTON,
COLLEGE OF PHARMACY,
SEATTLE.

(*To be continued.*)

THE UNITED STATES PHARMACOPŒIA FROM THE STANDPOINT OF THE ANALYST.*

BY L. E. WARREN.

Before the Food and Drugs Act was passed, in 1906, the Pharmacopœia did not so seriously engage the attention of drug analysts as it has since. Previous to that time it is true that those who were engaged in the production of substances described in the Pharmacopœia were in honor bound to insure that such products conformed in purity to the standards prescribed by the U. S. P., but the analyst was not held to the U. S. P. methods of analysis so long as he was confident that the methods of his own selection were as accurate as those of the Pharmacopœia. However, with the coming of the Food and Drugs Act, added responsibilities were placed on the Pharmacopœia. The regulations for the enforcement of the Food and Drugs Act prescribe that the methods of analysis given in the Pharmacopœia or the National Formulary shall be used in the analysis of all drugs for which the United States Pharmacopœia or the National Formulary describes methods. In this the federal officials have no choice unless it can be shown to the satisfaction of the trial courts that a particular method described in the U. S. P. or N. F. is faulty. Many states and municipalities also have adopted the Pharmacopœia as a standard in the enforcement of their drug laws.

For more than 20 years I have been engaged in the analysis of medicines and in preparing standards for them. During this time I have made use of the seventh, eighth and ninth revisions of the Pharmacopœia. In the earlier editions there were fewer substances (other than the vegetable drugs) for which assays were prescribed than obtain to-day. As the work became of greater and greater importance from a legal standpoint, the number of substances standardized by assay has markedly increased until in the issue now official there are no less than 277 substances for which a quantitative assay is provided. In a few cases an assay is provided for more than one constituent in a preparation. Examples are: Compound solution of iodine which assays the free iodine and the potassium iodide; the same is true for tincture of iodine compound; also for oil of bitter almond which determines the hydrocyanic acid and the benzaldehyde. In the enumeration mentioned the double assay is counted only as one. In addition to the quantitative assay for the chief constituent of many substances, the Pharmacopœia requires the determina-

* Read before Chicago Branch, A. Ph. A., January meeting, 1924.

tion of many constants such as specific gravity, the saponification numbers and the iodine numbers of numerous fats and oils.

In general, the analytical methods of the Pharmacopœia are reasonably satisfactory. There have been numerous criticisms of some of them, but I understand that most of the objectionable features are to be remedied in the forthcoming revision. However, there are still some minor faults which require modification before the book becomes irreproachable. I shall discuss a few of these in the hope that some of the suggestions may be of use to the Committee of Revision. Consequently I trust that I shall be pardoned if some of the criticisms offered have already been considered by this Committee.

OPTICAL PROPERTIES.

Birotatory Properties of Lactose.

The Pharmacopœia describes methods for determining the specific rotatory power of a number of organic substances such as volatile oils and the sugars, but it does not mention that certain sugars possess the property of what is known as birotation, *i. e.*, a change in the optical activity of the sugar solution on standing. The specific rotatory power of lactose is given in the textual description of that substance in the Pharmacopœia, but no mention is made of its birotatory peculiarities. Because of this omission, very serious errors might be obtained in the results by analysts. In the lactose description, directions should be given for overcoming the birotatory effects either by allowing the solution to stand over night or by adding a few drops of ammonia water before the solution is made up to volume.

Specific Rotatory Power of Alkaloids.

At present the specific rotatory values for alkaloids and their salts are not given although, if optically active, the statement is generally made that the alkaloid has optical properties. Since the specific rotatory power is a constant, it should be given for every optically active alkaloid and alkaloidal salt which is described in the Pharmacopœia. Such information would be of great value in establishing the purity of alkaloids in laboratory control. This information, or the most of it, is already in the literature, so that but little research would be necessary to make the changes. The value of the polariscope in the study of alkaloids has been emphasized by Murray[1] and by Eaton.[2]

Index of Refraction.

The index of refraction is an important factor in the analysis of oils and fats. What has been said about the value of the optical rotation applies with almost equal force to the importance of the indices of refraction. This constant should be stated much more frequently in the Pharmacopœia than it is.

SOLUBILITIES OF ORGANIC SUBSTANCES.

Petroleum Benzin.

The solubility of organic substances in petroleum benzin is not stated so frequently as it should be. There are several substances described in the Pharma-

[1] A. G. Murray, JOUR. A. PH. A., 10, 736, 1921.
[2] E. O. Eaton, *Jour. A. O. A. C.*, 5, 594, 1922.

copœia which are insoluble in petroleum benzin, but which are soluble in other organic solvents such as alcohol, chloroform and ether. For example, acetphenetidin is insoluble while amidopyrine is quite soluble. Cocaine is soluble and quinine is almost insoluble. These differences in solubility suggest methods for the separation of the individuals in either couple when in mixture. Another example is phenolphthalein which is insoluble in petroleum benzin; fats, such as those from chocolate are soluble. This feature is often employed in the analysis of phenolphthalein tablets containing chocolate—the fat is removed by petroleum benzin after which the phenolphthalein is removed by acetone, and still later the sugar, if present, by water. If the Pharmacopœia would state the solubility of such substances in petroleum benzin methods for the separation of many substances in mixtures would be suggested. It is true that this would require some research, as all of the needed information is not in the literature at present.

Benzol.

What has been stated about the desirability of more information concerning the solubility of organic substances in petroleum benzin applies with almost equal force to benzol. For example, caffeine is readily soluble in benzol, while theobromine requires 100,000 parts of the solvent for solution. A method for the separation of these alkaloids by means of this solvent is mentioned in the literature[3] yet the Pharmacopœia makes no statement about the solubility of caffeine in benzol. Likewise, morphine is insoluble in benzol as stated by the U. S. P., but the fact that codeine is soluble is not stated. In the manufacture of alkaloids from opium, this property is employed to advantage.

Color Reactions.

The Pharmacopœia does not give as many color reactions as it should. For example, the Pharmacopœia states that salicin gives a red color with sulphuric acid which disappears on the addition of water. Phenolphthalein gives a similar reaction but this is not mentioned. Many other substances give red colors with sulphuric acid such as thebaine, one of the opium alkaloids, and saligenin, so that the reaction with salicin is not characteristic.

Methyl Orange as an Indicator.

The Pharmacopœia still directs the use of methyl orange as an indicator in certain titrations. This is a procedure scarcely warranted. Critical analysts of to-day do not consider methyl orange a good indicator since there are others so much more sensitive and reliable. For example, in the titration of free ammonia the Pharmacopœia permits the use either of methyl orange or of litmus. Most analysts use alizarin red in titrating ammonia as this is much sharper in reaction than either litmus or methyl orange.

Solubilities of the Hydrochlorides of the Alkaloids in Chloroform.

The hydrochlorides of many of the alkaloids are soluble in chloroform—a fact which is not sufficiently emphasized by the Pharmacopœia. In some cases the Pharmacopœia gives the information, in some it does not and in others the statements made are in error. For example, no statement of this property is made in the description of emetine hydrochloride, cotarnine hydrochloride or quinine and

[3] Henry, "The Plant Alkaloids," p. 317, 1913.

urea hydrochloride. The Pharmacopœia states that diacetyl morphine is soluble in chloroform, whereas the salt is very soluble. However, this is to be corrected in the forthcoming revision. Ethylmorphine hydrochloride is said to be only slightly soluble in chloroform, whereas it is very appreciably soluble. In the analytic determinations of alkaloids where chloroform is used as a solvent, if the solution be not sufficiently alkaline, some of the alkaloid will be shaken out as hydrochloride. This will render the findings too high if the residue be weighed, or too low if the alkaloid be titrated. It is obvious that these errors and omissions should be remedied.

Identity Tests.

Since the Pharmacopœia now has such an important forensic status, it is desirable that it should include as many tests for the identity of chemical substances as is consistent with space. At present the Pharmacopœia is very deficient in this particular. Characteristic tests should be given, if known, but if not, such tests should be substituted as will not react with impurities likely to be present, and a sufficient number of such tests should be given as to exclude other substances by elimination. At the minimum two tests as nearly characteristic as possible should be included for every organic chemical. I will cite a few examples: For many years the most satisfactory test for citric acid has been that of Denigé. This test, which depends on the precipitation of mercuric acetone-dicarboxylate, is sensitive in presence of tartaric acid and is both delicate and reliable. I understand that a modification of this test has been accepted for the forthcoming revision. This, together with the calcium precipitation test already official, will be amply sufficient to identify citric acid. However, for tartaric acid the Pharmacopœia still lacks a duplicate test, the present one being a precipitation reaction by potassium acetate. The most satisfactory test that I know of is as follows:

"If a drop of ferrous sulphate solution be added to a solution of tartaric acid or a soluble tartrate, a few drops of hydrogen peroxide solution added and the mixture finally treated with an excess of sodium hydroxide solution, a fine violet coloration is produced, which in strong solution of a tartrate, is so deep as to appear almost black. The test is sensitive in presence of citrates or citric acid."

This test is so satisfactory that it should be included in the Pharmacopœia.

Likewise the tests for morphine and its salts are insufficient in number. The two following tests as applied to morphine sulphate should be included:

If 0.01 Gm. of morphine sulphate be dissolved in 5 cc. of water and a few drops of tenth-normal iodine solution added to a portion of the solution a dense brown precipitate should be produced at once. Under the microscope the newly formed precipitate is seen to be amorphous but this soon crystallizes to dark red-brown plates, which are arranged in elongated aggregations. Many of the crystals have violet or red tints and a few exhibit prismatic colors (distinction from the *salts of other opium alkaloids*).

If about 0.1 Gm. of morphine sulphate be dissolved in 10 cc. of water, a few drops of a saturated, aqueous solution of iodic acid added, and the mixture shaken with 2 cc. of chloroform, the chloroform layer should be colored violet (distinction from the *salts of other opium alkaloids*).

In a similar way the tests for codeine and its salts are inadequate. The two following tests as applied to codeine phosphate might be included with advantage:

If about 0.01 Gm. of codeine phosphate be dissolved in 5 cc. of water, a few drops of potassium zinc iodide solution added, the mixture agitated and allowed to stand for some time, orange-

yellow, plate-like rosettes of crystals should be formed which under the microscope are seen to be composed of long interlaced needles, sometimes arranged in feather-duster shaped forms (distinction from the *salts of other opium alkaloids*).

If about 0.01 Gm. of codeine phosphate be dissolved in 1 cc. of water, a few drops of potassium sulphocyanate solution added and the solution shaken, a white, crystalline precipitate should be formed (distinction from the *salts of many other opium alkaloids*).

In the proposed text of the Tenth Revision as just published,[1] a description for benzocaine is given. In this it is noted that benzocaine gives a precipitate with iodine test solution. The precipitate which is given in the reaction has unique properties which render this test one of great value in the detection of benzocaine. I have found the following reaction to give good results:

To about 1 cc. of the solution of benzocaine (1: 100) in very dilute hydrochloric acid add about 1 cc. of iodine solution, shake the mixture and allow to stand for 10 minutes with occasional agitation. A reddish brown precipitate forms which changes to beautiful, lustrous scales. The crystals are best observed by agitating the test-tube in direct sunlight.

To the naked eye the precipitate reminds the observer of herapathite. Under the low power of the microscope the crystals appear as irregular aggregations of tables and prisms, most of which are brown; but many are brilliant yellow or brass colored; some are grass-green, others are blue or dark bluish violet and occasionally one is observed which exhibits prismatic colors. Combinations of two or more of these varieties are common.

Since this compound is so dissimilar to most others likely to be met with in the analysis of medicines, I submit the test to the Committee of Revision as worthy of description in the text of the Pharmacopœia.

I trust that these few examples of minor imperfections in the Pharmacopœia will be sufficient to indicate that the analytical methods should be studied more critically in their minute details. The Association of Official Agricultural Chemists through its referees is constantly at work in perfecting analytical methods for substances not in the Pharmacopœia. As a result the methods adopted by the A. O. A. C. have an enviable reputation among chemists both here and abroad and have received cordial recognition by the courts. The Committee of Revision of the U. S. P. would do well to follow a similar plan of continuous revision. A critical study of the analytical methods of the Pharmacopœia could well occupy the entire time of an expert analyst.

SUMMARY.

From the standpoint of the analyst the Pharmacopœia is indispensable. It is particularly important to those engaged in the enforcement of drug laws and to those who manufacture drug products. In order to hold its prestige before the courts the Pharmacopœia should contain tests sufficient in number and reliability to identify every substance described in the text and to establish the degree of purity required for such substances. The Pharmacopœia now official is deficient in these requirements in several minor particulars although it is superior to any of its predecessors. The proposed text for the next revision so far as published is still deficient. The Pharmacopœia is not likely to become a satisfactory standard for the analyst until the plan of continuous revision is adopted by the Committee of Revision.

[1] JOUR. A. PH. A., 12, 1107, 1922.

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SHOULD COURSES IN BUSINESS ADMINISTRATION BE INCLUDED IN THE CURRICULA OF PHARMACY COLLEGES, AND IF SO, TO WHAT EXTENT?

A SYMPOSIUM.*

BY EDWARD SPEASE.[1]

This is a subject involving a question, and a question that cannot be given a direct answer. It is a question that time and experiment alone can answer. Still many views and opinions may be given expression and thus aid in solving this problem.

First of all, pharmacy, like medicine itself, has undergone many radical changes during the past decade and will undergo many more in the immediate future.

We are meeting with new ideas, some born of clinical experience and some based upon conjecture and, perhaps, a few founded either upon ignorance or cupidity. These ideas have to do with the use of new drugs and new methods, the use or disuse of old drugs and appliances, and even with the partial use or entire disuse of drugs and appliances.

A business or profession such as pharmacy is greatly affected by all these ideas and must be extremely alert to keep abreast of the times. It never seems valuable to meet changing conditions with carping criticism, but better to attempt to meet conditions as presented and improve upon them if possible.

We seem now to have established a foundation for our educational program; that is, graduation from high school and a certain brief fundamental course in pharmacy. If this foundation is a good one we can build upon it. Let us meet modern conditions and assume that it is.

It would seem that if a school is to meet modern needs, it should require the two fundamentals above mentioned of all students, and then offer a choice of work toward the higher degrees. For the student of scientific turn of mind, let the way be open to proceed as far as he may desire; and let the same field be open to him of the mercantile or merchandising ability.

For this latter student, give him the same opportunities offered to students who expect to enter other mercantile fields. Let him enter the same courses of preparation that the son of any other business man wishes to enter.

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* Part of the program of Section on Commercial Interests, A. Ph. A., Asheville meeting, 1923. It was requested that these papers and discussions be brought to the attention of the American Conference of Pharmaceutical Faculties.

[1] Paper read by E. E. Stanford.

The departments of business administration of our universities have pretty well outlined what they consider as proper preparation for business. They require certain fundamentals of college education, and they then add the courses in economics, banking, accounting, advertising, and so forth, to round out the curriculum. The student does not become a bookkeeper, but he becomes fitted for business. It might be well to offer certain applied courses dealing directly with pharmacy, after the student has acquired his knowledge of fundamentals.

It is the opinion of the writer, however, that certain short courses in bookkeeping, drug store merchandising, and what not should not be given, as they merely stuff the student's mind with pet schemes of individuals, which schemes may be entirely out of date by the time he is ready to use them.

I am old-fashioned enough to think that methods of salesmanship built up upon the gullibility of the buyer are on the wane. Business men are beginning to look at salesmanship in a larger way these days. If I could have my way, I would say for the schools to provide the opportunity and that time and modern needs will develop our students in the proper manner.

COMMENT.

E. E. STANFORD: If the time is not too short I will say just a word about some applications we try to make of some of these principles. We believe in experimental education; we do not think we have reached perfection yet. Every recent year we have changed our curriculum to some extent after taking stock from experience.

We offer three courses. The two-year minimum is limited practically to technical pharmaceutical subjects, but includes a course in English which receives the same credit as that offered to freshmen in other departments of the university. We included also for a time a course in commercial pharmacy, and have experimented with some of these brief courses in bookkeeping, etc., mentioned by the writer of this paper. We have eliminated them. Two years is an almost criminally short time to prepare a student even for his technical work, to say nothing of making a business man of him. It might seem ideal to graduate a high-grade technical expert, a man of culture, and a successful business man in one. But it can't be done in any two, three, or four years. A student is *not* a finished product—although a good many regard themselves as such. In all our courses we emphasize the development of the student's power to think and to observe. It is almost superfluous to say that, because all teachers like to think, they do this. But we believe it better to give our technical students as many cultural advantages as their time with us will permit, and frankly to admit to them that there are certain phases of their future work with which they will have to acquaint themselves by experience. It is a mistake to try to make a student think he knows a whole lot of stuff that has been half boiled down and shot in hypodermically against time. He is apt to be too favorably impressed with his own attainments in spite of all we can say. It is up to the retail druggist, as a practical business man, to take any overplus of cocksureness out of him, and to aid him to build business experience on the foundation of thinking-power and technical training he has accumulated. But don't expect a paragon of full-developed wisdom or skill of any kind in a man of only two years' training.

In our three-year course we aim to include some commercial subjects of a university grade. We are going on to the three-year minimum at the earliest possible moment.

Our four-year course, leading to the degree of Bachelor of Science, includes what might be termed a common freshman year in that it includes about a year's credit of cultural and general educational work. This is given, however, scattered throughout the four years instead of all together as a pre-pharmic year. We believe this for many reasons to be the better plan. Besides, under the Ohio law our men can count each year of our present four as a year toward the four-year experience requirement for eligibility to registration. A pre-pharmic year could not be so counted. We are trying to work out with other sections of the university a plan by which students of a commercial bent can take university courses in business administration and allied subjects, while those of a scientific turn can follow science and not take commercial work at all. Thus

we are trying to produce two types of four-year man—one a commercial man, with some of the fundamentals of a university business training, and one a scientific man, with university scientific training, prepared to go into research, manufacturing, and dispensing rather than into the business management of a retail drug store.

THEODORE J. BRADLEY.

In thinking over the topic assigned to me, I came to the conclusion that there was no better way for discussing it than by describing the experiment along this line that our college is carrying on. This experiment is costing us in the neighborhood of $5000 a year, which may be all loss, but we hope it will not. There has been pressure brought upon the colleges of pharmacy for many years to teach some commercial pharmacy or business administration for pharmacists. We felt this pressure and finally sold ourselves the idea.

Many years ago we began experimenting with the commercial pharmacy, and our treatment of it was similar to that in many other colleges of pharmacy. The method was to devote a few hours a week during the school year to the subject, and it was carried on almost entirely by inviting experts in various lines to come in and lecture on related subjects to the class. These experts might or might not be pharmacists. When we discussed banking, we had a banker come in and give one lecture or two or three. If we discussed insurance we had an insurance man come in. If we discussed coöperative buying, we had a pharmacist who was interested in that, and the work looked very good. It was difficult to find out why the course did not meet with a proper response. The reason was difficult to find, but we believe that it was a failure, not because of the material but because of the method; that these were subjects that should be treated by the laboratory method, and that it wasn't of much use to teach pharmacists a subject which was near to their own interests, as accounting for instance, by having them listen to an expert accountant tell them about accounting. As soon as we realized that this was probably the reason of the failure, we decided that when we teach accounting or bookkeeping or banking, it must be by actual work, rather than by listening to somebody talk about it. Of course, these are extreme examples of what I mean. We found that when we had a banker tell us of his work, the class might be greatly interested while they were there, but the next week it was rather difficult to have them present, and so it went on from one subject to another; hence, we were convinced that the plan was not successful.

The old pharmacy course is primarily for the protection of the public. While the pharmacist receives the training, that training is primarily to put the practice of pharmacy into competent hands, and the benefit to the individual pharmacist is a secondary matter; also, this minimum training is necessary for everyone who is to be a licensed pharmacist. After students have secured this minimum training, there is a very sharp division of the road—there is a relatively small number of students who become greatly interested in the scientific side of pharmacy, and we have advanced courses along scientific lines, but there has been no provision for the larger proportion of students, who were, primarily, interested in the commercial aspects of pharmacy. We consider that the course is for all the students until they have acquired a minimum preparation as pharmacists, but at the end of that time, it divides into two parts, one made up of those who wish to go on with scientific study, and the other of those who wish to study business methods for pharmacists. This

is primarily for the benefit of the individual although it is true that a better business man is a better servant of the public too.

Harvard University and Dartmouth College, in our section, have successful graduate schools of business, and many of the universities and larger colleges have such departments. We felt that in order to put this work on the high plane that we wanted, and to obtain the coöperation of the Harvard School of Business, which we did secure, that we must model our course upon these graduate schools of business, excepting that we should apply the work to pharmaceutical conditions. Then the questions came up, how should we treat the subjects and who should be the teachers? We looked into these very carefully, and we were unable to find a pharmacist who had the requisite successful experience in business teaching. That was a very difficult combination, and we determined that we would have to do it the other way—would have to get a successful teacher of business, who could afterwards learn the pharmaceutical application of his work, and also to whom we should supply some pharmaceutical assistants to take care of the pharmaceutical parts of the work. We found a college graduate who was also a graduate of one of those large business schools, and who had nine years' experience in large high schools where he had been at the head of the commercial departments. He found the prospect of a change from high school work to college work attractive, and was glad to come to us. He is a hard worker, and is bringing out various treatises on accounting for pharmacists which are being published serially in a drug journal and will appear later in book form. We adopted the course two years ago this summer. We went at it quietly and announced in one of the numbers of our bulletin, that this course was to be given, only three months before the work began. The response was very slight, which again we were not sorry about, because it gave the teacher a small class to work with—it didn't exhaust him with routine work, while he was working out the details of his course; whereas, if he had started with a large class, which we might have secured by publicity, his energy would have been used up in handling the details of the work, and he would have had some difficulty in working out the course. We don't know that we are right in placing the course as a graduate course. We feel sure that we are right in developing a high-grade course of business, so that my answer to the first part of the question that we are discussing is—Yes, pharmacy schools should teach business. We are convinced of this. But the response has not been as great as it must be if it is to be given in a graduate course. We cannot go on spending several thousand dollars a year indefinitely on a course like this. If the number of students does not increase, satisfactorily, we shall put it in as a department of study in the under-graduate course. This would immediately increase the class to a large number.

This brings me down nearly to the end of my discussion, and to the second part of the question under consideration; namely, how much time should be given to commercial subjects in a pharmacy course? There are some who believe that commercial subjects should not be included in a pharmacy course at all and there are others who feel that we should throw most of the scientific courses overboard, and replace them with commercial subjects. We can't agree with either extreme, and we can't figure the proportion of time against the proportion of business that is done along commercial lines and along professional lines in a drug store. Under present-day conditions in the United States, the practice of pharmacy is largely

commercial, but we can't base our extent of teaching commercial subjects on the ratio between commercial and professional work in a drug store. To do so would be ridiculous, because the teaching of commercial branches has its technical side as well as pharmacy has, or any other branch of study, and we can't spend a lot of time in the teaching of subjects that have not been developed as teaching subjects. The methods of handling the teaching of commercial pharmacy have to be developed, and we can't give the time to it which would be perhaps a waste of time out of proportion to the development of the teaching of the subject. With these truths in mind, we believe that in a total pharmacy course, the amount of time given to commercial pharmacy could be in the neighborhood of 20 per cent. of the total time. That puts it on the basis of a regular department of study, comparable with the chemistry department, the pharmacy department or the materia medica department. We feel that it is on a par with any of these departments.

In conclusion, I wish to state that I do not believe that questions on commercial pharmacy should be part of a State board examination. Many of you may disagree with me on this.

CHARLES H. STOCKING.

Other participants in this symposium have expressed their views in regard to courses in business administration from the standpoint of the work being done along this line in the various schools represented. At Michigan, our greatest difficulty has been to find adequate time in our curriculum for courses of this character in spite of the fact that we have had a four-year curriculum since 1896. At this time the program of studies for the freshman year was identical with that of the College of Literature, Science and the Arts. About 1900, however, the elective system was introduced in the College of Literature, Science and the Arts, and the College of Pharmacy broke away from the all-freshman year idea. But even since that time, the requirements of the four-year curriculum have been very rigid, offering little opportunity for elective studies. Our two-year curriculum, which was discontinued in 1917, was made up entirely of required subjects, as is also the three-year curriculum which has been in operation since 1913.

It is a well-known fact that the best colleges of engineering have foundation courses that are required of all students during the first two years, followed by specialized courses for two or more years leading to definite degrees in engineering for the type of work done. Reed, in his recent report on "Training for the Public Profession of the Law," criticized legal education on the ground that law schools throughout the country give but one course for all, irrespective of the branch of the law the student may expect to follow. Some criticism has also been directed against medical education in recent years with this same thought in mind. A medical student desiring to specialize along certain lines has little opportunity because his whole course in college has been cut and planned along general medical lines only.

With these facts before us, the faculty of the College of Pharmacy began studying the situation in so far as pharmaceutical education was concerned. The results of this study gave us a three-year curriculum practically the same as in the past, and containing two three-hour courses in economics in addition to the two-hour course in commercial pharmacy that has been included in the three-year curricu-

lum for a number of years. Several vital changes, however, were brought in the four-year curriculum. Instead of laying down one rigid plan of study for all, as in the past, ample opportunity is now afforded the students to pursue studies which will fit them for the particular type of work they expect to follow after graduation. To be more specific, we have three plans, three curricula, leading to the bachelor's degree in three distinct and separate fields. The freshman and sophomore years are identical for all the students, specialization beginning in the junior year. What we term Plan "A" of the four-year curricula is intended for those who expect to go into general, analytical or manufacturing pharmacy. Plan "B" includes courses for the laboratory or clinical technician. Plan "C" is the one which interests us in this particular discussion on acount of the fact that it is the plan which has been worked out at Michigan to include a considerable number of hours in business administration. This plan is intended for those who expect to take up work of a pharmaceutical administrative character in manufacturing plants and in retail stores. Of the 125 credit hours required for graduation, fifteen, or 12 per cent., are strictly of a commercial or business administrative character. Two to five hours of elective courses may be added to the list at the option of the student, making the percentage slightly higher.

I think Dean Bradley pointed out a while ago that the percentage of work that could be given along the line of business administration would reach a figure as high as twenty, or even possibly thirty per cent. of the total. Here is a figure that is considerably less, and yet is far above anything that was possible under our old plan. At the same time, this type of work is not forced upon any student. If a student wishes to follow scientific work entirely and does not wish to spend time in college with commercial courses he will select Plan "A" or Plan "B." We feel that this is the best way to handle the situation. A certain amount of freedom is, of course, permitted under any one of the plans of work due to the elective privileges. Thus a student enrolled under Plan "A" or Plan "B" may elect from two to four hours' work in business administrative courses, if he so desires. If he wishes to specialize in business administrative work of a pharmaceutical character he will naturally elect Plan "C," which includes all the basic courses in pharmacy, chemistry, physics, the languages, etc., in addition to approximately fifteen hours of commercial courses.

We feel it our duty, following up the experiences of the past and the demands of the present, to give opportunity for specialization in pharmaceutical administration to those who desire it. With the exception of a course in commercial pharmacy which is conducted by the speaker, all the courses in business administration are given by the department of economics of the university. We do not spend time teaching show card writing, window trimming, "scientific" salesmanship, etc., although we do touch upon these and other practical every-day topics of a commercial nature, and frequently invite proprietors of drug stores and others in commercial fields to talk to the students on timely topics.

The young man or woman entering retail pharmacy to-day with no training along commercial lines is seriously handicapped. We are all glad for the slogan—"Your Druggist Is More than a Merchant," but we are nevertheless aware of the fact that the good druggist is *also* a good merchant. The professional pharmacist who serves the public most faithfully and most efficiently must do business on a

profitable basis or he is eventually doomed to failure and his mission as a guardian of the public health from the pharmaceutical standpoint is lost forever. He attends a college of pharmacy to study chemistry, physics, bacteriology, physiology, pharmacy and other strictly professional subjects in order to be able to interpret and fill physicians' prescriptions and to dispense drugs and chemicals with safety to others and satisfaction to himself. And then when he gets located on his chosen "corner," he soon finds commercial problems facing him at every turn.

If he was unfortunate enough to attend a college of pharmacy giving no courses in business administration, he must travel a rugged road for no brief period of time until he becomes familiar with at least a few exceedingly important basic principles having to do with the conduct of his business. It is my opinion, therefore, that a college of pharmacy can, without serious interference with professional courses, offer some work of a commercial nature that will be of inestimable value to the future business man or woman in pharmacy. Furthermore, work of this character should be made a matter of choice with the student from the elective standpoint so that those who prefer to follow pure science as a life-work may have every opportunity to choose a complete curriculum of scientific subjects, and, on the other hand, so that those who desire courses of a business character may have equal opportunity for electing a reasonable amount of these.

ROBERT P. FISCHELIS.

In answering the question whether business administration should be included in a pharmacy course or not, I am rather of the opinion that we should have such courses running right along with the pharmacy course. In the early days of teaching this subject, it was difficult to arouse interest on the part of the student in business administration. I think this was largely due to the fact that so many of the proprietors of drug stores ridiculed the idea of having a college of pharmacy attempt to teach business subjects, and also partly due to the way in which the teaching was attempted in the beginning. I think, as Dean Bradley does, that if the course is to be given, it ought to be given properly, and it ought to deal in fundamentals. I cannot state any better example of what I have in mind than to call attention to the discussion we had yesterday on the teaching of chemistry by someone who is not a pharmacist,* so as to give the pharmacist a general appreciation of the science as a whole and not merely its pharmaceutical aspects. But, unquestionably, a method of coördinating chemistry with pharmacy is needed somewhere in the course. It was suggested that the coördination be brought about in the laboratory, and again, the laboratory method of teaching business administration is the only method that is going to be successful. It is proper to have the fundamentals of business administration taught by experts in their respective fields, yet I know of such courses which have failed miserably because the experts devoted their lectures to a discussion of high finance, in which the students had no special interest. Pharmacy students want to see the application of any subject in the curriculum to their future work, and it should be shown them soon enough to keep up their interest in the course. I find in going about drug stores—and I have made it my business in the last year to go into the drug stores more often than I had before, to find out

* "Chemical Education in Pharmacy Schools," by John C. Krantz, Jr., p. 785, JOUR. A. PH. A., September 1923.

what the problems of pharmacists are, with the idea of helping to train men to meet those problems—that the managers of stores are not only leaving the pharmaceutical training of young men practically entirely in the hands of the college, but are also doing the same thing with business administration. There was a time when the proprietor of a drug store would teach a young man something, but in these days of keen competition, owners hire pharmacists with the idea of relieving themselves of certain responsibilities, and expect clerks to go ahead and assume those responsibilities without any further training in the drug store. They hire other men or women with much less or no pharmaceutical training to do the ordinary work of selling in the drug store. So we cannot any longer expect help from the store proprietors in training prospective pharmacists and that impresses me more than ever with the importance of giving business administration courses to the students, and stressing the application of such training to the retail drug business.

Coming down to what we do in our school, I can say that we can only give, at the present time, a course such as that outlined in the "syllabus." In some ways it is satisfactory, but in many other ways it is unsatisfactory. We make no pretense of giving courses in accounting and bookkeeping, because we realize that such courses to be of value must be given separately, but when it comes to advertising, selling, and allied subjects, we try to give the student some insight into the problems involved so that he will know whether a proposition when it is put up to him by a manufacturing house, or a wholesale house, is a good one or not for his store. So much literature on advertising and selling is sent to the retail druggist every day that we feel we ought to impress upon the student in some way the true value of such material, and we try to stress the professional viewpoint throughout all our teaching of business administration.

There is another reason why there should be coördination in the teaching of business administration and the courses in pharmacy. It ought to be impressed on the student that the reason the drug store is different from any ordinary merchandising establishment is because there is a pharmacist in charge, and the store has a professional atmosphere. We feel that we ought to stress the "more than a merchant" idea and we do this by not decrying legitimate commercial enterprise but by pointing out at every stage how professional atmosphere and professional practice represent the greatest asset of the so-called commercial pharmacist.

FREDERICK J. WULLING spoke briefly and asked that he be privileged to submit a paper, "The Imperative Need of Higher Educational Standards," instead of his remarks.

ABSTRACT OF DISCUSSIONS.

FRANK H. FREERICKS: A business course in a college of pharmacy is out of place in the curriculum of a college of pharmacy. If the colleges of pharmacy would devote the same amount of energy and the same amount of money in seeing to it that the retail pharmacist has the opportunity to practice pharmacy, then the colleges would be serving the cause of pharmacy far better than by the introduction of a business course in the curriculum.

W. BRUCE PHILIP: In the University of California, we have had for three years a course in commercial pharmacy of one hour a week, for the senior class—and it has been my pleasure and privilege to give that course. I am the only retail drug store owner on the faculty, and that may be one of the reasons why it was allotted to me to tell the pupils something of commercial pharmacy. I wonder if you realize that the college of pharmacy teaches the analysis or the synthesis of everything that the druggist comes in contact with; those having had the course in commercial phar-

macy. If you mention anything in botany or plant life, the students can immediately start with where the plant comes from and they can carry the analysis down to the finest definition of the cell, or even the constituents of the cell. A mineral is mentioned, and they immediately think down to the elements, etc. So you have a person trained in the analysis of things he comes in contact with, and during this course in commercial pharmacy, we simply desire to show the analytically trained mind that the same values can be applied to business in all its phases. This is the idea of the course. We are not definite in demanding that the student answer any of the questions in the four quarterly examinations in an exact way. He has the privilege of using his analytical mind to determine the answers.

Now what do we give? We start first in the analysis of the prescription work—each student must fully analyze this. Then we take up the types of drug stores, analyzing them briefly. Then we study locations, analyze why locations are good and why others are bad. We start with the outside of the drug store—the value of light and other advantages, letting the student continue beyond the lecture. Then we take up the inside arrangements, the value of show cases, of prescription and other departments. We show what becomes of the wholesale order and how to order in a wholesale way; that is, we consider the order from the moment it leaves the drug store through the wholesale department back again to the drug store and on to the shelf. These things are gone into with an idea that there is always a simple, correct way and sometimes there are several ways of doing each particular part of the drug store business. We also give a brief analysis of salesmanship. Two things we emphasize in salesmanship—one, truth in salesmanship; second, the need of knowledge relating to the goods. Then we bring to the student the value of his botany; the selling value of everything he learns outside of commercial pharmacy—the importance of how to get a position, and, briefly, how to employ help. Then, if it is possible, we go into the study of sundries; for example, we take rubber goods, have a table of samples and show hot water bags, etc., and explain why some are colored and some are not—what a breast pump or stomach tube is. Other lines are somewhat similarly explained. We dwell on the value of drug publications, letting the students know that each drug publication is a post-graduate course in pharmacy and through the very brief explanation and display of trade magazines, show their value in pharmacy. This in a superficial way is the outline of the course.

Mr. Philip then cited several gratifying results of the work.

F. W. E. STEDEM inquired of the speaker whether students are taught when not to sell. Mr. Philip replied that there were two sides to all questions and failure to present both represented inefficiency in instruction.

LEON MONELL: It is necessary for anyone in the business of pharmacy to have a certain amount of business training. The amount depends on the kind of business being conducted, whether of a professional or commercial type.

The average professional business man is overlooking the facts when he says it is not necessary to have a commercial training in pharmacy. No pharmacy can be conducted without it. It also requires the highest type of training.

To develop the professional side, you must go out and sell your services to the doctor and there is no problem as difficult as to try to sell a professional man. This demands the highest type of salesmanship.

I think that commercial courses should be put in the curriculum of all pharmacy colleges. We should not compete with the schools of commerce. Anyone who intends to become the president of a chain of drug stores, or is going to do merchandising, should go to a school of commerce.

I believe that if you try to train a man to become a good pharmacist, you should select a man with a mind that knows pharmacy as well as one who is commercially trained. The schools of pharmacy should divide the third year, which should be optional, giving either a professional year for those desiring it, or a commercial year for those entering the commercial drug stores.

FRANK H. FREERICKS: When this matter was up before, I rather briefly expressed some convictions I had on the subject. I have been much helped by what we have heard from Mr. Philip this morning, and I can see how, in the way that he undertakes to teach a more or less commercial subject, he is doing a real good, but, nevertheless, I still hold the conviction that there is no place for so-called commercial pharmacy in a college of pharmacy. The field of a college of pharmacy is to prepare the student to practice pharmacy; his commercial education and knowledge should be acquired just as any other man acquires business knowledge in any other business

pursuit. I do believe that this cry for teaching of commercial subjects and this call for business instruction in colleges of pharmacy is almost entirely due to the fact that the faculties of colleges of pharmacy—who have been so very largely instrumental in securing our prerequisite laws, of which I very heartily approve—have been feeling that the complaint of the student after he graduates is justified, and that complaint of the student is, "Here I have been spending two or three years to acquire all kinds of knowledge, to acquire an education in pharmacy, and now I am out in the world, and I have no use for it, I may not apply it." I say the colleges are realizing that complaint to be justified, and for that reason they are going into a field that does not belong in a college of pharmacy. They want to give the student in a college of pharmacy something the student feels is of value to him, but which he should have acquired either by practical experience in a drug store or by attending some school of commerce.

My idea is that colleges of pharmacy instead of devoting energy and expense in teaching subjects that do not belong to colleges of pharmacy, should devote that same energy and same expense toward changing conditions so that the graduate in pharmacy can practice pharmacy after he goes out into the world. I do believe that the colleges of pharmacy can do a world of good in bringing retail pharmacy back to the pharmacist by coöperating with colleges of medicine and giving the student in medicine an opportunity to go into a college of pharmacy, gratuitously, if necessary—I should say by all means gratuitously—give him an opportunity of learning something about pharmacy and drugs in the colleges of pharmacy. If the colleges of pharmacy and their faculties would devote themselves to closer contact with the faculties in medical schools, in order to bring home to the medical men and students the writing of prescriptions, and the knowledge of therapeutics, in a few years much could be accomplished.

D. F. JONES: It occurs to me that Mr. Philip has had such experience that he views the matter from a different angle.

I sometimes wonder how many members of faculties present the idea that the student has invested in technical training a sum amounting to from twelve hundred to two thousand dollars; that this amount of money is an investment, and should be expected to earn dividends, just as money invested in stock. This fact should be pressed home: that he should continually be selling his professional services, and the oftener sold, the larger grows the stock.

I doubt very much if the average faculty member has the vision that will put across this idea in such a way that it will stay with the young man through the rest of his life. Again I say that I think Mr. Philip, through his peculiar experience, has the retailer's viewpoint.

I have observed that with the introduction of a business course in schools of pharmacy, many graduates, having a thousand dollars at their disposal, immediately proceed to compete with the department store, with thousands of dollars at their disposal, and years of business experience; and the Greek who in the conduct of his business, can live on what the druggist wastes.

If he were taught to use his technical knowledge in a practical way, avoiding the keen competition of those experienced, we would gradually have built up about the country, well established retail drug stores, that could serve their communities in a creditable as well as in a profitable manner.

JOSEPH JACOBS stated that the discussion was very interesting to him. He had a paper at the Denver A. Ph. A. meeting along the lines indicated by this discussion. In his opinion pharmacists should be in position to derive a livelihood from their activities, that this is essential for holding up the standing of the profession, and when merchandising is honorably conducted, the one who does so reflects just as much credit on the business and the profession as the one who exclusively follows pharmacy. He referred with a degree of pride to the fact that he, who was classed among the merchandisers, had been honored by the University of Georgia with a degree of Doctor of Science and had been given charge of the botanical garden at the university. A pharmacist should not neglect pharmacy, and it is possible to do this while providing for further income if that is necessary for the business. The standing and dignity of the profession should be upheld.

FRANK H. FREERICKS granted that all Mr. Jacobs had said was of real value but did not pertain to the consideration of commercial courses in pharmacy schools. In his opinion the school of pharmacy was not the place to train a man for business.

THE DEPARTMENT OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

(EDITOR'S NOTE: The first part of Professor Beard's address consisted of greetings to the student body and a brief review of the progress of pharmaceutical education in the South.
C. B. JORDAN, *Chairman and Editor.*)

CLASS CONSCIOUSNESS AND MENTAL ATTITUDES.

BY J. G. BEARD.

(An address delivered in Nov. 1923 before the pharmacy students at the Medical College of Virginia.)

The message I bring to you concerns a matter very close to my heart and is about a subject the importance of which cannot be over-emphasized. I have reference to what we may, for lack of a better term, call class consciousness: something having to do with the mental attitude of a pharmacist towards his profession.

It is well at the very start to state that pharmacy is and always will be exactly what its practitioners believe it to be—neither better nor worse, higher nor lower than it is made by the thinking of its followers. The explanation of this fact is largely psychological. You and I know that we strive for *possible* goals and pass up those which are beyond what we *think* are our limitations. If that goal happens to be a certain result in a business enterprise and we are positive that we can attain to it, the chances are mightily in favor of our doing so. The very fact of our certainty carries with it the assurance of our interest and determination. But, on the other hand, if the accomplishment seems beyond our ability we usually abandon all thought of its attainment and failure ensues. We can say then that any enterprise in which we are engaged is controlled and limited by what we *think* we can do with it. This is not to say that we can do all that we believe we can do—too many failures attest the falsity of such an idea, but it is to say that we can seldom do a thing which our judgment tells us is beyond our capacities. We are defeated at the very start by our minds. This reasoning can logically be carried to the vast enterprise which we call pharmacy.

But what is pharmacy? There are many definitions which can be and are applied to it, but all save one are technical in phraseology. Your teachers have told you that it is the art or the science or the business of this, that, or the other thing, and they are right. In telling you what pharmacy is, however, they are thinking in terms of distinctions, giving you definitions that distinguish drug manipulations and sales from other forms of effort. The exceptional definition I spoke of applies equally well to every profession or business and is this: *Pharmacy is the concrete embodiment of the qualities of its human forces.* It is one sort of thing in this generation and another sort entirely when a new group takes it over, but always it is an expression of the men directing its tendency. These men in turn are the slaves of their own thoughts. If this assumption is correct and you are wishful that the profession during your tenancy shall maintain its highest traditions, it behooves you to begin now, as students, so to train your thinking that when you come to take over the directorship of this second oldest of all the callings you can perpetuate the best of its past, render keener the initiative of its present, and add even greater honor to its practice in the future.

A fundamental point to start from in your thinking is the conversion of yourself to the proposition that pharmacy, rightfully practiced, is one of the higher forms of human endeavor. Until this premise is firmly established in your mind you can never get out of or put into the calling all that the work holds of promise. With the right sort of thinking this conclusion will be inevitable. Nothing is clearer to me than the fact that no person can give his best, his conscientious best, to an

undertaking unless it holds not only his interest but his admiration as well. His interest, so that he may get joy from his job; his admiration, so that he gets honest pride in the performance of his duty. In order for superlative effort to flow from you into a task, your heart must belong entirely to the task, and your heart can be won only after you have been convinced of the worthiness of the work. I say to you in all earnestness that pharmacy has in it the necessary elements to win your regard and to hold your interest.

Two main considerations determine the real value of any calling. First, the service it renders the world, and, second, the profit it returns to its followers. Let us briefly apply these tests to pharmacy, and see whether the work is worth while and whether or not it pays. We can start, I think, with the proposition that the world needs medicines to alleviate, palliate, and cure pain and disease. Until civilization and science carry us beyond what now seems possible, the world is going to continue to need these mediums of relief; in the present stage of man's being it seems inconceivable that he could carry on lacking the assistance of drugs. Imagine, if you can, surgery without anesthetics, infection without antiseptics, pain without anodynes, disease without specifics! We cannot harbor such notions. If necessity for drugs is vital, it is imperative that the supply be ample, not only in quantity but in quality. But simply recognizing the necessity does not guarantee the production. To whom, then, must the world turn to satisfy its drug demands? Not to doctors surely, proficient though they are in the administration of the finished product; nor to chemists, qualified though they be in certain processes; but to one single group and only one single group can it turn—the pharmacists. Without this class of worker pain would be unrelieved, disease would run rampant, distress would tie the hands of mankind. But happily pharmacy prevents the chance of this condition, and so ably does it measure up to its obligation that the minds of men never dwell upon the horrors that even a day of drug deprivation would bring. Going into every crook and cranny of the globe; searching the seas, the soil and the air, it requisitions with skill and art, science and industry, a host of crude materials from which it fashions the refined agents that we know as modern medicines. Certainly, then, we can say that pharmacy is indispensable; its service necessary; and its practice a humane performance, and saying this we have answered in the affirmative the question: "Is the work worth while?"

But what of the monetary reward it returns to its practitioners? I have said that not only should a calling be profitable to the world but it should also furnish profit to its followers. How does pharmacy measure up when judged by this standard? To begin with there are ten divisions of pharmacy and the operatives in the different divisions receive different degrees of compensation. I do not pretend to know the financial reward that each of these groups receives for its labor. I doubt if any one could do else than generalize about the subject since so many considerations must be taken into account before fixing upon any definite figures. Such factors as section of country, size of firm, nature of business, length of service, and, above all, character of worker, enter into any determination of recompense. I will say, however, that the reward is reasonably liberal if the worker is properly equipped educationally and is sufficiently industrious and ambitious to reach the maximum salaries paid. Measured by standards of profit pharmacy does not rank as high as several other professions, but it nevertheless may be made to yield a very comfortable living with sufficient average to provide against the infirmities of age. In other words, unless one has fixed upon money as the supreme essential of life with its accompanying dollar judgment of values, the practice of pharmacy is not only worth while but is fairly remunerative as well. If the premises I have tried to establish are conceded, namely, that pharmacy is an honorable calling entitled to your highest regard, and offers monetary rewards to satisfy reasonable desires for comforts and pleasures—I say if these points are conceded, then you must admit that pharmacists should be able to bring to the work the right attitude of mind.

Unfortunately, however, and I say this with the greatest reluctance, the average pharmacist of to-day does not exhibit this attitude towards his calling. I shall not go so far as to say that he is ashamed of it, though some pharmacists leave that impression with a casual observer, but I will say that he is thinking of his work too much in terms of failings, faults and errors, and too little in terms of integrity, worthiness and pride. Constantly he is asking the question: What is the matter with pharmacy? and invariably he is answering his own query incorrectly. There is nothing the matter with pharmacy! There may be certain objectionable practices carried on in some of the departmentized institutions that parade under the banner of drug store, but this is no indictment of pharmacy—it is an infliction. This sort of thing is exceptional, not typical. We want to get away from the sort of analytical thinking wherein poisonous reagents are employed and dark-looking results sought for, we want to forget analysis altogether for a time and practice some synthesis. We have done too much tearing down; let us now do some building up. * * * * * *

There is a very pressing need just now for an agency that can unify and harmonize the various forces in American pharmacy; some sort of medium that can evolve from the conglomerate and conflicting policies of to-day a program that will bring closer together the man power of pharmacy, and which will so establish a parallelism of purpose as to cause the several branches of the drug business to travel alongside one another towards some common objective. While it is true that each of the ten divisions of pharmacy has individual aims and specialized purposes, it is equally true that all ten have a common concern in the welfare and advancement of pharmacy. Anything which advantages the whole benefits each part, and anything which checks the advancement of one branch slows up the progress of the entire profession. Wisdom, therefore, urges that the several units of pharmacy organize as one unit instead of holding apart as unrelated bodies.

But can the different divisions of pharmacy be converted to this opinion, be persuaded to this program? It is to be doubted if any other calling has among its personnel as diversified a type of worker as is represented on pharmacy's roster. This is not to say that other professions and trades have an entirely uniform sort of membership, but it is to point out that they have a more homogeneous group to carry through their specialized undertakings than is the case with the drug business. It is in consequence easier for such closely related and resembling units to crystallize their ideas and efforts in some predetermined program; simpler for them to work under the direction of some centralized agency than is possible for the somewhat dissimilar groups that severally compose the human forces in pharmacy. But in spite of the seeming diversity of our aims and the differences in our make-up, we can and must establish some sort of class consciousness that will bring order out of chaos, union out of separation, and harmony out of disaffection.

Individualism has developed to a further degree in pharmacy than in any occupation I can think of. Every man thinks for himself and acts for himself irrespective of results among his fellow-craftsmen. This sort of independence is all very well so long as the individual prospers and the class is not interfered with, but only that long. We have now passed the point where such a course is permissible and have reached a stage where collectivity should be practiced. We must accordingly modify our ways of thinking and adopt methods in comformity with the spirit of the times and in agreement with universal custom. Plural authority must supplant individual freedom in order that the good of all may be paramount. (This is not Bolshevistic doctrine but a fundamental feature of the American Constitution—merely another way of saying that the majority shall rule.) Pharmacy needs to set up a unifying institution of such character, vision, and force that we can safely entrust our several interests to its guardianship. And with its establishment there should develop a mental attitude in pharmacists which will bring them to see that only by collective action can individuals succeed; make them see too that they are the only class which to-day lacks a close-knit organization to

formulate and enforce policies. I like to believe that there is already in existence just such an institution as I have mentioned. It would, of course, need to be somewhat modified to serve our varied purposes, but this would involve a very simple change in machinery and not in constitution. I have reference to the American Pharmaceutical Association, the oldest drug organization in this country. If this is the logical medium through which we can all work, it is very important that it begin to function comprehensively in the immediate future and for this reason:

Shortly now retail pharmacy is either going to split apart into two distinct divisions, the one departmental and wholly commercial, the other apothecarial and largely scientific; or else it will narrow down again to an enterprise confined chiefly to the supply of materials related to disease. It is improbable that the developments of the past few years can continue for long in their present directions. When the change takes place, it is important that it be in an orderly and not in a hit-or-miss manner. This orderliness can be guaranteed only if some central directing agency is in control. But this controlling agent ought to be thinking and acting in relation to pharmacy as an entity, not merely in relation to a constituent part of the whole. It is true that the retail side of the drug industry is quantitatively the largest side, but it is also true that its interests are so intertwined with the eight other sides that it cannot afford and should not be allowed to pursue independently any course which ignores the wishes or the welfare of the others. No organization in this country except the American Pharmaceutical Association even pretends to work in the interests of more than two divisions of pharmacy. No other body than the A. Ph. A. is sufficiently comprehensive in scope or varied in personnel to engineer the complex machinery that must function in the maintenance and advancement of pharmacy as a whole. We may well agree upon this parent of all drug organizations as the medium for corralling the human forces of pharmacy, and making them into one big family. When we boil down to essentials and vaporize the confusing elements that keep us from seeing clearly, we find that practically nothing stands in the way of carrying this sort of program through.

There may be another and a better way out of our present difficulties, but to my mind the solution lies in having a masterful organization which will be sufficiently intelligent and comprehensive to formulate the right kind of policies and sufficiently powerful to force its issues to a successful conclusion. It would be an organization composed of at least ten sections, each section covering a particular phase of pharmacy. Ordinarily a section would be a law unto itself, the retailers deliberating upon their problems, the wholesalers upon theirs, the manufacturers upon theirs. This would be true until an issue arose affecting groups outside a particular section, that is, affecting pharmacy as whole, and then all of the sections sitting together in executive session could discuss the matter from every angle and take such action as would advantage the entire profession. Independent action has been thoroughly tried; it does not work. Mass action has never been given a chance; why not try it out? It has no element of risk and it does hold out possibilities of success.

There may be those among you who are thinking that earlier in my remarks I have advocated an "ostrich policy" for all of the unhealthy conditions of pharmacy as it is now practiced, a policy which would ask you to refuse to see ills in the body pharmaceutic instead of expecting you to recognize and to combat them forcefully. If such have been your thoughts, you do my meaning an injustice. I admit the presence of certain evils, but I contend that they are mental and not physical, human and not professional, curable and not deadly. I maintain that the ills will disappear when and not until pharmacists themselves so change their attitudes as to allow healthy and not diseased notions to course through their thinking; when they practice the preachments of their distinguished fellow-druggist, Coué, by saying and believing that every day in every way pharmacy is getting better and better. There must also, of course, be the resolve to substitute

collective activity for individual initiative when matters of general concern arise, but this will follow and not precede the development of correct mental attitudes. Only when the thinking of pharmacists gets right will their actions lead to a real success. And in proportion to the way they think all these things will they strive to put pharmacy where it belongs. I charge you, therefore, to think healthily and loftily, as well as intensively and technically, so that when you take over the superintendency of to-morrow's pharmacy you will not only guarantee its financial prosperity but will so engineer its destiny as to create in the hearts of its followers the pride of profession, the ideals of service, and the love of work that characterized the members of our craft in the olden years* * * * * *

Shortly now college years will lengthen to their end and you will find yourself entering upon a new era where hopes and promises, fears and failures abound. And as this era adds age to itself striding forward through its span, Destiny will decree for some of you a pleasant path, for some a thorny trail. I am not content to wish for you a happy career, or bon voyage alone, but instead I shall hope that you travel humbly if the road be clear and gamely if the way be hard; that you may meet success with dignity and adversity with a smile. While others are wishing for you a rose-strewn path, I shall be hoping that you travel gallantly; while others are wishing that you could avoid all troublous tracks, I shall hope that however rough the way you will advance unwhiningly. Thousands of days lie on ahead of you that have to be met, days of fight and days of fun, good and bad all mixed together. May you have strength for the struggles, grit for the game, abundance of pleasure, and your share of good luck!

STANDARDS FOR WHISKY AND BRANDY TO BE INCLUDED IN THE PHARMACOPŒIA.

Announcement has just been made by E. Fullerton Cook, Chairman of the Revision Committee of the United States Pharmacopœia, that standards for whisky and brandy as medicines will be included in the new Pharmacopœia now being revised. This is in response to a demand by the physicians of the country.

Under the national prohibition laws, whisky and brandy are classed as medicines and as such are legally prescribed in many cases of serious illness, but at the present time no legal standards exist for their purity.

All physicians of the General Revision Committee, acting as a sub-committee, were appointed to study the situation and take the necessary action. This subcommittee has issued the following statement:

"In view of the fact that a large number of physicians in the United States believe alcohol to be a valuable therapeutic agent, and in view of the wide-spread adulteration of the alcoholic liquors at present available, the members of this Referee Committee feel that for the protection of the public there should be an official standard for medicinal spirits."

By including standards for whisky and brandy as medicines, in the Pharmacopœia, which is the legal standard for drugs and medicines under the Food and Drugs Act, the machinery of the U. S. Department of Agriculture and of the boards of health and boards of pharmacy throughout the country is enlisted in protecting the sick against adulterated and poisonous products.

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* Professor Beard's address did not end at this point, but rather continued in the development of the idea that the much-abused term Service should be properly defined, assimilated, and translated into a sacred resolve to make the drug business not only fruitful in profit to its practitioners but above all to make it contribute generously to the health and welfare of mankind. Lack of space, however, forbids the publication of the remaining portion of the lecture which ended with the concluding paragraph following that to which this reference applies.—C. B. J.

COMMITTEE REPORTS

REPORT OF THE COMMITTEE ON LEGISLATION.*

The work done in legislation on pharmacy must be considered especially good this year due to three reasons: first—the several interests and associations concerned coöperated better than ever before; second—as a result they received more serious and effective consideration by legislative bodies; third—legislation in narcotic, alcohol and so-called reform legislation has about reached its peak and spent its force and influence and a more sane consideration of the problems is shown by legislative bodies brought about largely by a growing sentiment among the people against legislating morals.

In the Bill on peyote and cannabis indica to check the use of peyote by the Indians, cannabis was dropped from the Bill when the difference between the drugs was made clear to the House Committee.

Senator King's Bill to require statement on label of quantity and proportion of any alcohol, morphine, opium, cocaine, heroin, alpha or beta-eucaine, chloroform, cannabis, chloral, arsenic, anesthesin, antipyrine, belladonna, bromine, cantharides, henbane, iodine, nux vomica, phenacetin, phenol, strychnine, thyroids or veronal contained in same, showed the tendency to control all potent drugs—the Bill was withdrawn after argument showing the uselessness of such legislation was made clear.

Alcohol legislation developed—the Treasury Regulation No. 3335 containing the 25% forfeiture bond which was withdrawn after a general protest; it was followed by No. 3398 containing the same 25% forfeiture bond. This time a stronger protest was made and on November 22, 1922, No. 3310 was issued permitting filing of three alternate bond forms from all of which the 25% liquidated damage clause is eliminated.

Next came the famous Prohibition Mimeographs, especially Mimeograph No. 282 issued by Prohibition Commissioner without approval of Secretary of Treasury or the Commissioner of Internal Revenue and requiring the most intricate records to be kept of all uses of alcohol and based upon Treasury Decision No. 3410 requiring permittees to keep such records of alcohol used as Federal Prohibition Commissioner might require. The latter, however, went too far and a universal protest arose, based upon impracticability, ineffectiveness and burdensomeness of same. The protest was effective, the Mimeograph No. 282 withdrawn and the agreement reached that Secretary of Treasury and Commissioner of Internal Revenue must pass all "Mims." before their issuance. The outcome was the issuance of Treasury Decision No. 3396 which is possible and not burdensome.

Next came Representative Wood of Indiana's Bill to create a Bureau of Prohibition, which provided that the Commissioner of Prohibition be the enforcer of Prohibition and Harrison Acts. This would have created a prohibition autocracy amenable only to President of the United States and, possibly, ruined the pharmaceutical industry. On February 19, 1923, the Committee of Judiciary of the House had hearings on Wood's Bill and strong arguments were used to oppose it with the result that it was never reported out of the Committee. It may be introduced again at next Congress but until then users of legitimate alcohol can rest easy. Since then the Prohibition Unit has prepared revised form of Regulations No. 60 which are now in force. On March 21st Commissioner of Internal Revenue appointed an Advisory Committee on alcohol problems, made up of representative members of the leading alcohol-using industries. It is a fine committee; this committee met at the Commissioner of Internal Revenue's office on Friday, June 1st, and organized. The Committee is known as the Trade Alcohol Advisory Committee. Commissioner of Internal Revenue Blair opened the meeting and stated that the purpose of the Committee was to furnish information and advice to the authorities administering the prohibition laws, so far as the drug, chemical and other legitimate industries were concerned. The Committee consists of W. A. Sailer, *President*, H. E. Howe, *Secretary*, W. J. Schieffelin, Martin J. Ittner, Frank A. Blair, M. C. Whitaker, R. H. Bond, C. L. Reese, R. M. Cain, S. C. Henry, James H. Beal. Some very plain truths were told Mr. Haynes by Messrs. Sailer, Schieffelin, Ittner, Whitaker

* Report read in abstract; resolutions approved, Asheville meeting, A. Ph. A. See p. 910, October JOUR. A. PH. A.

and Bond. It developed that Mr. Blair was not in accord with Mr. Haynes and in consequence these gentlemen told Mr. Haynes very plainly where he was wrong and where the real trouble lies. It is understood that no alcohol regulations affecting the legitimate users thereof will be issued by Mr. Haynes without consulting with and obtaining the approval of the above Committee. One of the consequences of the existence of this Committee may be the creation of a separate division of the Commissioner of Internal Revenue Department on a par with the Prohibition Unit, probably under a separate deputy commissioner. One of the gratifying consequences of the above meeting, next to the conviction that Mr. Blair has taken a definite stand to treat legitimate users of alcohol fairly and see that they are not hampered and annoyed by police and more or less picayune methods, is the issuance on May 31st of T. D. 3483 by the Bureau of Internal Revenue permitting the purchase of 10 gallons or less of alcohol without confirmation. This amends T. D. 3449 which was a very drastic and restrictive regulation. If this right to purchase without registration and confirmation is extended to small amounts of whisky by the retail drug trade, then much of the trouble of the trade will be eliminated. The above results probably followed the speech delivered by Judge Britt, Chief Counsel of the Prohibition Unit, before the annual meeting of the American Drug Manufacturers' Association at the Biltmore on April 17th last when he insisted that every legitimate user of alcohol or distilled spirits fight and continue to fight for his legal rights under the law and that he was with them in this fight as long as they observed that law.

Narcotic Legislation. In Narcotic Legislation we have not been as successful and both our importing and exporting business in narcotics and drugs has suffered as the result of the enactment in May 1922 of "An Act to Prohibit the Importation and Use of Opium for Other than Medicinal Purposes," being an amendment of the Act approved February 9, 1909. This Act appointed a Federal Narcotics Control Board composed of Secretaries of State, Treasury and Commerce. Importation of any narcotic drugs except crude opium and coca leaves is prohibited and only such amounts of these as the above board find necessary to provide for the legitimate medicinal uses in the United States. It only allows export of narcotics to countries that have ratified the International Opium Convention of 1912. This has reduced the export pharmaceutical business very materially. Fortunately Congress adjourned without making any appropriation for carrying on the work of this Board and its duties were hence transferred to the Narcotic Division of the Prohibition Unit. A meeting of those interested was called this Spring by the Federal Narcotics Control Board at which the legitimate needs for 1923 were determined and the Board lifted the embargo, thus permitting legitimate importers and manufacturers to again resume operations. In the meantime there is a shortage of opium and coca leaves; at best it is almost impossible to determine the amount of legitimately used opium and coca leaves in advance..

Narcotic Legislation has become anti-dope legislation just as alcohol legislation has become prohibition legislation. Publicity does not help the situation very much.

It is proposed that the Commissioner of Internal Revenue appoint a Federal Narcotic Commissioner who would have sole charge of the enforcement of the Federal narcotic laws subject to the supervision of the Commissioner of Internal Revenue and the Secretary of Treasury. The present Narcotic Division of the Prohibition Unit would become a separate unit of the Treasury Department under the direct supervision of the Federal Narcotic Commissioner. It is the opinion of your Committee that such a move should be endorsed by the A. Ph. A. Then we might be able to make our burdens of narcotic transactions lighter and get away from the tiresome report and record keeping.

It is to be noted that a movement is on foot to eliminate completely the exemption features of the Harrison Act and, also, another to absolutely prohibit the manufacture and sale of heroin. Both of these movements are objectionable and undesirable and some action opposing them should be taken. The former increases our burdens and the other eliminates a very desirable and efficient drug.

The Model State Narcotic Bill has been drafted and has given general satisfaction and will meet a long-felt need in that it was drafted with the purpose of eliminating conflict between Federal and State Narcotic Laws—the American Pharmaceutical Association should endorse it.

State Legislation. Numerous bills covering narcotic legislation and alcohol legislation and the prohibition of sale of certain synthetic medicinals principally phenol derivatives have

been brought before the legislatures of 44 States. As usual most of them were drafted by persons ignorant of the meaning and bearing of their contents. Practically all of them have been amended or killed so that but little disastrous or objectionable legislation has passed into law. We are over-legislated in this country. If the existing laws would be studied and codified so that duplications and overlapping statutes would be eliminated and a simple much reduced code of laws produced in its place, then legislation would become more rational and less strenuous in amount. Your committee recommends:

1—Adoption of a resolution approving the Model State Narcotic Bill.

2—Adoption of a resolution commending appointment of Advisory Alcohol Committee.

3—Adoption of a resolution recommending appointment of Industrial Alcohol Commissioner.

4—Adoption of a resolution recommending appointment of Federal Narcotic Commissioner.

5—Adoption of a resolution opposing removing Prohibition Commissioner from the supervision and control of Commissioner of Internal Revenue and Secretary of Treasury.

6—Adoption of a resolution opposing any movement to eliminate exemption clauses of the Harrison Act.

7—Adoption of a resolution opposing any movement to prohibit manufacture and sale of heroin.

Very respectfully submitted,
A. R. L. DOHME, *Chairman.*

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE BOARD OF DIRECTORS.

Office of the Secretary, 192 Roseville Ave., Newark, N. J.

LETTER NO. 10.

January 8, 1924.

To the Members of the Board of Directors:

47. Publicity for Board Transactions: Motion No. 8 (see item 33, page 20, Letter No. 6) has been carried. The Secretary of the Board will be guided accordingly. A summary of actions taken by the Board at its recent meeting in Washington has been sent to the pharmaceutical journals.

48. Selection of Headquarters Hotel: Motion No. 11 (see item 44, page 34, Letter No. 8) has been carried. The Statler Hotel, Buffalo, will therefore be headquarters for the next meeting. The Secretary of the Board has notified Local Secretary Gregory of the A. Ph. A., Secretary Cooper of the A. C. P. F. and Secretary Christensen of the N. A. B. P. of this action.

49. Election of New Members: Motion No. 12 (see item 45, page 34, Letter No. 12) has been carried. The Secretary of the Board has notified the new members of their election.

50. Changes in Membership Committee: Secretary Day writes as follows:

"Since I wrote you last in regard to the membership committee, I have discovered that several others of those listed for appointment are no longer members of the Association. They are as follows:

District No. 4—La.—William August Worner, New Orleans. Texas—J. M. Duggan, San Antonio.

District No. 6—Utah—W. H. Dayton, Salt Lake City.

District No. 7—Idaho—H. H. Whittlesey, Pocatello. Washington—G. Elmer Brown, Spokane.

"I suggest no action regarding these other than that they be cut off the committee before its publication in the JOURNAL with the exception that a successor should be appointed in place of Mr. Whittlesey as chairman of the Idaho membership committee. I suggest that Roy M. Spargur of Twin Falls be appointed chairman.

"I am sending a copy of this letter to Editor Eberle assuming that my recommendation will be accepted by the Board of Directors and thinking that he may already have set up the list of committees for publication in the next number of the JOURNAL."

If there is no objection within ten days, the suggested changes will be considered as approved and the necessary changes will be made.

51. Proposed Budget for Appropriations for the Year 1924: The Finance Committee through Chairman LaWall submits the follow-

ing proposed budget for appropriations for the year 1924.

Appropriations for general expenses:

No.		
1	Salaries	$6400.00
2	Printing, postage and stationery	1000.00
3	Clerical expenses, Secretary's office	416.00
4	Miscellaneous expenses	200.00
5	Stenographers	350.00
6	Traveling expenses	500.00
7	Committee on Membership	500.00
8	Committee on Unofficial Standards	100.00
9	Year Book	6000.00
10	Premium on Treasurer's Bond	62.50
11	Auditing Treasurer's Books	80.00
12	National Drug Trade Conference	200.00
13	Scientific Section	25.00
14	Commercial Interests Section	25.00
15	Practical Pharmacy and Dispensing Section	25.00
16	Education and Legislation Section	25.00
17	Historical Pharmacy Section	25.00
18	National Syllabus Committee	25.00
19	Recipe Book Committee	50.00
20	Local Branch Committee	25.00
21	Drug Trade Board Public Information	200.00
22	House of Delegates	100.00
24	Headquarters Building Committee	100.00
	Total	$16,433.50

No.			
25	Association Journal		11,000.00
	(*a*) Publication	$9500.00	
	(*b*) Clerical	1000.00	
	(*c*) Postage & stationery	300.00	
	(*d*) Freight, Hauling, etc.	200.00	
		$11,000.00	
26	National Formulary		1000.00
27	Badges and bars		50.00
28	Certificates		50.00
	Total		$12,100.00
	Appropriations for general expenses		16,433.50
	Grand total for the year		$28,533.50

Motion No. 13. *It is moved by LaWall, seconded by Fischelis, that the proposed budget for appropriations for 1924 be approved.*

52. Progress on A. Ph. A. Recipe Book: Dr. Arny, who had been requested to see Chairman Lascoff of the Committee on Recipe Book and inquire into the progress that has been made by the committee, writes that he has conferred with Mr. Lascoff and ascertained that a total of 706 recipes have been collected by the committee—642 of them prior to 1921 and 64 since 1921. All of these have been printed in the JOURNAL of the Association. The work is now being held up to await U. S. P. and N. F. deletions and Mr. Lascoff plans to present a paper covering the work of the committee at the March meeting of the New York Branch of the A. Ph. A. The matter of an appropriation for editing the "copy" for the Recipe Book (see item 35, Letter No. 6, Page 21) will not be urged at this time.

53. Comments on Changes in Constitution and By-Laws: The thirty days within which members of the Board of Directors were to send to Dr. Beal, comments on proposed changes in constitution and by-laws, based on Dr. Walton's suggestions, have expired and those who have not already done so are urged to send their comments in as soon as possible. Dr. Beal is Chairman of the Committee on Constitution and By-Laws.

54. Applicants for Membership: The following applications for active membership, accompanied by the first year's dues and proper endorsements, have been received.

No. 226, Lucian Scott Berry, Ashley, Illinois; No. 227, Walter A. Pierho, 4228 N. Winchester Ave., Chicago, Illinois; No. 228, Vahan A. Swajian, 67 Parkhurst Pl. E., Detroit, Michigan; No. 229, Luther M. Mardigian, 13631 Lincoln Ave., Highland Park, Mich.; No. 230, Abe. M. Kulwinsky, 8915 Commercial Ave., So. Chicago, Ill.; No. 231, Howard Harlan Jones, 3405 Fairview Ave., Baltimore, Maryland; No. 232, James A. Dines, 501 Mill Avenue, Tempe, Arizona; No. 233, David P. Kunnboll, 752 E. Welletta St., Phoenix, Arizona; No. 234, Arthur G. Hulett, 318 W. Roosevelt, Phoenix, Arizona; No. 235, E. M. F. Ivey, Warren, Arizona; No. 236, J. B. Weber, Boston & Arizona Ave., Chandler, Arizona; No. 237, Will Marlar, Flagstaff, Arizona; No. 238, Fred W. Ritter, Sun Drug Co., Phoenix, Arizona; No. 239, William L. Toms, 116 Bryant St., Rahway, N. J.; No. 240, Percy O. V. March, 28 Farley Ave., Newark, N. J.; No. 241, Samuel A. Brody, 920 S. Hermitage

Ave., Chicago, Ill.; No. 242, J. R. Bullington, 1515 Wolfe St., Little Rock, Ark.; No, 243, Victor Boggs, Rison, Ark.; No. 244, Mrs. Olive C. Jones, Grannis, Ark.; No. 245, F. M. McDonald, Thornton, Ark.; No. 246, Jesse Roy McWhorter, Hope, Ark.; No. 247, W. B. Smith, Jasper, Ark.; No. 248, Miss Grace M. Parker, De Valls Bluff, Ark.; No. 249, Joe E. Eaton, Shirley, Ark.; No. 250, James N. Wesson, Stephens, Ark.; No. 251, J. M. Simpson, Rector, Ark.; No. 252, John French Crooks, 1217 Lawrence Ave., Chicago, Ill.; No. 253, Joseph Lester Hayman, 55 Carson St., Morgantown, W. Va.; No. 254, Channing W. Harrison, U. S. Food & Drug Station, Park Ave. Bldg., Baltimore, Md.; No. 255, Eugen Albert Pemberton, Jr., 1269 So. 1st St., Louisville, Ky.; No. 256, Isreal Goldman, 130—32nd St., Flatbush, Brooklyn, N. Y.; No. 257, Gustave Berger Swanson, Edmonds, Washington; No. 258, Raymond Nicholson MacLeod, 2449—10th Ave., North Seattle, Wash.; No. 259, William John Blair, 340—18th Ave.. Seattle, Wash.; No. 260, Louis Fischer, R. F. D. No. 1, Box 478, Seattle, Wash.; No. 261, Norman Edward Gable, 6059 Cooper Ave., Detroit, Mich.; No. 262, Katie Moy, 1305 Newport Ave., Detroit, Mich.; No. 263, Paul R. Rollins, 627—4th St., Bremerton, Wash.; No. 264, Alvin Axel Peterson, 4514—8th Ave., N. E., Seattle, Wash.; No. 265, Lucille Turnacliff, 4714—18th Ave., N. E., Seattle, Wash.; No. 266, Stanley J. Hermanson, 7358 Woodlawn Ave., Seattle, Wash.; No. 267, Paul A. Monroe, 7208 Woodlawn Ave., Seattle, Wash.; No. 268, Newton E. Warner, 4220½—12th., N. E., Seattle, Wash.; No. 269, Emmett Cheek, 323 E. Washington Ave., No. Little Rock, Ark.; No. 270, Duvigier Bollinger, Salem, Ark.; No. 271, O. G. Nichols, 520 E. 15th St., Little Rock, Ark.; No. 272, Otis R. Goodman, 3832 W. 13th St., Little Rock, Ark.; No. 273, Frank Eiden Jr., 1317 W. 9th St., Little Rock, Ark.; No. 274, Frank Tate, Atoka, Okla.; No. 275, Ralph Eugene Case, 3428 Galloway Ave., Memphis, Tenn.; No. 276, Milton B. Otto, 3007 A Indiana Ave., St. Louis, Mo.; No. 277, Lawrence L. Bergevin, Osage County, Apperson, Okla.; No. 278, Leonizio S. Garza, P. O. Box 367, Mercedes, Texas; No. 279, Walter Wichterman, 505 N. Division St., Ann Arbor, Mich.; No. 280, Charles H. Gauger, 294 Highland Ave., Buffalo, N. Y.; No. 281, Hyman B. Lachov, 2111 Augusta St., Chicago, Ill.; No. 282, John Krasnick, 317 S. State St., Ann Arbor, Mich.

(*Motion No. 14.*) *Vote on applications for active membership in the American Pharmaceutical Association.*

ROBERT P. FISCHELIS, *Secretary*,
Board of Directors, A. Ph. A.

LETTER NO. 11.

To the Members of the Board of Directors:

55: Invitation to Join Federation of American Professional Societies in Supporting Mellon Tax Program: Chairman Beal requests that the following communication, forwarded to the Association by Mr. B. Tappen Fairchild, be placed before the Board of Directors for action:

TELEGRAM.

"At meeting to-day moved to form an organization to be known as the Federation of American Professional Societies we invite your association as we are inviting other national professional societies to join with us in public support of Mellon Tax Program as a non-partisan measure of immediate economic necessity and justice. We invite you to appoint one or more representatives as part of a general committee to appear before the proper congressional bodies and then to actively urge passage of the proposals regarding earned incomes and particularly the 25% reduction on surtaxes on earned incomes. The failure to pass these would bear heavily on the professional workers, men and women of America. We feel these measures for the first time promise a hope of relief for the professional workers who have hitherto been the special victims of an economic discrimination perhaps unintentional. Their failure or material modification now because of the lack of an efficient body representing the economic interests of professional workers would be a disaster. Individual action may be useful and is being taken by a number of organizations but the need of the moment is for concerted solidarity by national organization. Hoping for favorable action on the part of your association.

OWEN JOHNSON,
c/o The Authors' League of America,
222 East 17th Street,
New York, N. Y."

In order to bring the matter before the Board immediately, as quick action is desired, the following motion is made:

(*Motion No. 15.*) *It is moved by Fischelis that the Chairman of the Board be authorized to name a representative of the American Pharmaceutical Association to appear before the proper Congressional Committees in coöperation with representatives from other professional associa-*

tions, for the purpose of supporting the Mellon Tax Program as a non-partisan measure of immediate economic necessity and justice. (The Secretary wishes to call attention to the fact that according to the new By-Laws of the Board motions made by mail in the interim between meetings require no second.) Please use the enclosed card for voting.

56. A Correction: On page 46 of Letter No. 9, in the fifteenth line from the top of the page, the word "three" should be changed to four. Will you kindly make this correction in your file copy of this letter.

57. Budget for 1924: Motion No. 13 (see Item 51, page 48, Letter No. 10) has been approved. The budget for appropriations for the year 1924 as submitted by the Finance Committee therefore stands approved. The Secretary and the Treasurer of the Association and the Chairman of the Finance Committee will please take note.

58. Election of New Members: Motion No. 14 (see Item 54, page 50, Letter No. 10) has been carried. The Secretary of the Board has notified the members of their election.

59. Committee Appointments and Appointment of Delegates: President Arny has appointed the following Committees and Delegates. Approval of these appointments by the Board of Directors is required by the By-Laws. Please indicate your approval or disapproval of the appointments on the enclosed card.

COMMITTEES.

International Pharmaceutical Nomenclature: Chairman, A. G. DuMez, Washington, D. C.; Otto Raubenheimer, Brooklyn, N. Y.; Henry Kraemer, Mt. Clemens, Mich.; Arno Viehoever, Philadelphia, Pa.; Horatio C. Wood, Philadelphia, Pa.

Physiological Testing: Chairman, P. S. Pittenger, Philadelphia, Pa.; W. A. Pearson, Philadelphia, Pa.; L. W. Rowe, Detroit, Mich.; Henry C. Colson, Baltimore, Md.; C. R. Eckler, Danville, Ind.; E. L. Newcomb, Minneapolis, Minn.; E. L. Harvey, Philadelphia, Pa.

Weights and Measures: Chairman, Jeannot Hostmann, New York, N. Y.; R. P. Fischelis, Newark, N. J.; H. M. Faser, University, Miss.; C. M. Snow, Chicago, Ill.; T. J. Bradley, Boston, Mass.

DELEGATES.

To National Wholesale Druggists' Association: Chairman, W. T. Hankey, Cleveland, Ohio; W. J. Schieffelin, New York, N. Y.; C. M. Kline, Philadelphia, Pa.; L. E. Lyons, New Orleans, La.; L. C. Hopp, Cleveland, Ohio.

To National Drug Trade Conference: Chairman, S. L. Hilton, Washington, D. C.; J. H. Beal, Urbana, Ill.; A. R. L. Dohme, Baltimore, Md.

To National Association of Retail Druggists: Chairman, C. H. Packard, Boston, Mass.; R. S. Lehman, New York, N. Y.; J. L. Lascoff, New York, N. Y.

To American Medical Association: Chairman, J. H. Beal, Urbana, Ill.; H. A. B. Dunning, Baltimore, Md.; R. A. Hatcher, New York, N. Y.; Bernard Fantus, Chicago, Ill.

To National Association of Boards of Pharmacy: Chairman, L. L. Walton, Williamsport, Pa.; John Culley, Ogden, Utah; W. B. Day, Chicago, Ill.; J. W. Gayle, Frankfort, Ky.

To American Conference of Pharmaceutical Faculties: Chairman, Geo. M. Beringer, Camden, N. J.; C. A. Mayo, Cincinnati, Ohio; J. G. Godding, Boston, Mass.

To Conference on Narcotic Drugs: Chairman, Jeannot Hostmann, New York, N. Y.; E. G. Eberle, Philadelphia, Pa.

To United Medicine Manufacturers of America: S. L. Hilton, Washington, D. C.

To National Conference on Pharmaceutical Research: Delegate, H. V. Arny, Chairman, New York, N. Y. Associates: Geo. D. Beal, Urbana, Ill.; Henry Kraemer, Mt. Clemens, Mich.; Wilbur L. Scoville, Detroit, Mich.; George M. Beringer, Camden, N. J.

To Proprietary Association: W. C. Anderson, Brooklyn, N. Y.

To Iowa (Meeting Feb. 5, 1924): D. F. Jones, Watertown, S. D.

To Minnesota (Meeting Feb. 12, 1924): George Judisch, Ames, Iowa.

60. Applicants for Membership. The following applications for active membership, accompanied by the first year's dues and proper endorsements have been received:

No. 283, Hugh Tennant, Lander Hall, University of Washington, Seattle, Wash.; No. 284, Harry Warner Ayers, 1808 North 40th St., Apt. A., Seattle, Wash.; No. 285, A. Lewellyn Lawwill, 4528—20th Ave., N. E., Seattle, Wash.; No. 286, T. R. Cuthbert Carr, 4011 North 22nd St., Tacoma, Wash.; No. 286, Thomas Joseph Donahue, 1869 Gains St., Little Rock, Ark.; No. 288, Milton Jungling, 69 Lembeck Ave., Jersey City, N. J.; No. 289, Zdenek F. Klan, Praha VIII-255, Czechoslovaki; No. 290, Henry Pfeiffer, 400 S. 4th Street,

St. Louis, Missouri; No. 291, Henry J. Nie, 1228 East 12th St., Kansas City, Mo.; No. 292, William Donald Wardlaw, 631 Garfield Ave., Scottdale, Pa.; No. 293, William Silberman, 6330 Throop St., Chicago, Ill.; No. 294, Myron Shapiro, 29 Virginia Ave., Jersey City, N. J.; No. 295, Walter Johnson, Des Arc, Arkansas; No. 296, Roger W. Perkins, 6231 Kenwood Ave., Chicago, Ill.; No. 297, Arvil Summerill Kimbro, 6345 University Ave., Chicago, Ill.; No. 298, Albert Edward Nordstrom, 604 Center St., Waukegan, Ill.; No. 299, Thomas George Crawford, 822 Forest Ave., Oak Park, Ill.; No. 300, Walter Williamson Seibert, Ashley, Ill.; No. 301, Aaron Pritikin, 4448 N. Bernard St., Chicago, Ill.; No. 302, Sam Levy, 1419 S. St., Louis Ave., Chicago, Ill.; No. 303, Harold Lizer, 2418 W. 34th Pl., Chicago, Ill.; No 304, Isaac M. Glass, 1917 South 7th St., Springfield, Ill.; No. 305, Harry Cooperman, 3327 W. Flournoy St., Chicago, Ill.; No. 306, Fern Ward Buooa, 3800 Third St., Des Moines, Iowa; No. 307, Margaret E. Pellett, 1839 Barth Ave., Indianapolis, Ind.; No. 308, Charles E. Willets, 4 East North Ave., Pittsburgh, Pa.; No. 309, Marvin Jackson Andrews, 601 Cathedral St., Baltimore, Md.; No. 310, J. A. Goetz, Osceola, Ark.; No. 311, Stanley Armistead, Waldron, Ark.; No. 312, H. S. Gentry, Alabama Polytechnic Institute, Dept. of Pharmacy, Auburn, Alabama; No. 313, Henry Stanley Grady, 2149 St. James Ave., Cincinnati, Ohio.

(*Motion No. 16.*) *Vote on applications for membership in the American Pharmaceutical Association.*

ROBERT P. FISCHELIS, *Secretary*,
Board of Directors, A. Ph. A.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Board of Directors."—Part of Chapter VI, Article VI of the By-Laws.

Article IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

CHICAGO.

The 139th regular meeting of the Chicago Branch of the American Pharmaceutical Association was held at the University of Illinois School of Pharmacy Building, January 11, 1924, with President Warren in the chair. The meeting was preceded by a dinner at the Hotel LaSalle in honor of the guests of the Branch, Doctors E. Fullerton Cook, E. L. Newcomb, A. G. DuMez, E. A. Ruddiman. A. John Schwarz. At the first session, reports were heard from the Secretary-Treasurer, and the Committee on Nominations. The Secretary-Treasurer's report is as follows:

During the year 1923 the Branch has held 8 regular meetings, the 131st to 138th, inclusive.

At the meetings during the year, Dr. H. H. Rusby of New York, Dr. David Klein of the Wilson Laboratories, Dr. Robert W. Keeton, of the Research Laboratories of Rush Medical College, Dr. Egil T. Olsen, Superintendent, Englewood Hospital, J. A. Hynes, of the U. S. Customs Service, L. E. Warren, Chemist, American Medical Association Laboratories, Secretary H. C. Christensen of the N. A. B. P., Secretary S. C. Henry of the N. A. R. D., Dr. Bernard Fantus, Dean W. B. Day, Professors C. M. Snow, A. H. Clark, E. N. Gathercoal, and others have presented addresses.

The meeting at which Dr. Rusby presented an illustrated lecture on the Mulford Expedition to South America was one of our best meetings in point of interest and of attendance. However, the "Insulin" meeting was also very attractive in both of these respects. All the meetings were well attended and of great interest. One meeting, that of December, was an innovation in that it was entirely entertainment. At this meeting a welcome was extended to new members and the Lambda

Kappa Sigma sorority furnished splendid entertainment and supper. The average attendance for the 8 meetings was 64, with the largest attendance 205.

The membership of the Branch January 2, 1924, was 480. On January 2, 1923, it was 446. The net gain for the year is 34.

FINANCIAL STATEMENT.

January 2, 1923	
Balance on hand	$ 82.98
December 31, 1923	
Contributions from members	164.50
Commissions on new members	102.00
	$349.48
December 31, 1923	
Printing & postage	$140.18
Dinner expenses	25.75
Speakers	75.00
Miscellaneous	19.30
Balance on hand	89.25
	$349.48

The report of the Committee on Nominations is as follows:

OFFICERS.

President, L. E. Warren.
1st Vice-President, Otto H. Mentz.
2nd Vice-President, R. A. Linke.
3rd Vice-President, Josephine Dyniewicz.
Delegate to the House of Delegates, E. N. Gathercoal.
Secy.-Treas., E. N. Gathercoal.

COMMITTEE CHAIRMEN.

Membership, Wm. Gray.
Legislation, James H. Wells.
Practice, I. A. Becker.
Medical Relations, Dr. Bernard Fantus.
Publicity, Samuel C. Henry.

The report of the committee was adopted and the nominees declared elected.

Dr. E. Fullerton Cook was presented and delivered an instructive address on the subject, "The Pharmacopœia in the Making." Dr. Cook discussed the history of the Pharmacopœial Committee, indicating some of the struggles of Dr. Lyman Spaulding in 1819–20 which resulted in the production of the first U. S. Pharmacopœia. He presented, also, the history of the present Revision Committee, describing its division into sub-committees, and the functions of the chairman, and the executive committee, which consists of the 15 sub-committee chairmen, and of the sub-committees themselves. He pointed out the vast amount of correspondence involved in the revision work, mentioning the fact that already more than 2000 large pages of typewritten matter had been distributed in the form of circulars to each of the 50 members of the Revision Committee. Each of the sub-committees also has a large file of circulars; that of the sub-committee on botany and pharmacognosy totaled more than 1400 pages to date. He illustrated the address with lantern slides, tracing the development of the monograph on "Epinephrine." The address was very instructive to those in the audience who were not so familiar with revision matters and opened the way for the address by Dr. E. L. Newcomb on "Some of the Unsolved Problems of the Present U. S. P. and N. F. Revisions."

Dr. Newcomb said, in part, it was the American Pharmaceutical Association and its active members that years ago saved the U. S. P., and since 1850 pharmacists have taken an active part in the U. S. P. revisions. To-day the actual work of revision outside of questions of scope and dosage lies almost entirely in the hands of pharmaceutical workers. Not only is pharmacy thus interested in the U. S. P., but the A. Ph. A. owns and revises the National Formulary. These two books make the retail druggist more than a merchant.

One of the problems in connection with U. S. P. revision that continually arises is the personnel of the Revision Committee. Should the revision be taken out of the hands of organized medicine and pharmacy and placed in charge of a committee of Government employees? Perhaps the greatest argument in favor of such a change is the question that arises in the minds of some as to the unbiased probity of the members of the committee. Let it be said at this time that in the entire history of the revision of the U. S. P., the Revision Committee has invariably been made up of men unbiased and whose sole interest lay in producing a book of standards absolutely without bias. Grocers in their State and national associations make no scientific study of the standards for foods and spices, hence the Government officials have had to step in and the A. O. A. C. has been formed to establish such standards. Medicine and pharmacy, however, in their organizations are constantly studying scientific standards and no occasion exists for the Government to take exclusive charge of these standard works dealing with medicines.

Let it be said at this time, that no sub-committee of the U. S. P. Revision Committee should have exclusive power in any matter,

but all matters approved by any sub-committee should receive the endorsement of the full committee.

The second problem in connection with the revision is as to whether changes should be made unless something in the literature of the previous decade justifies such a change or whether the revision should be based on research investigations by the committee or sub-committees. The present revision of both of these standard works is a combining of both of these methods. A review of all published work has been made and much research investigation also has been carried out in connection with the revision. As one looks over the monographs of the Pharmacopœia, especially those that have remained through many revisions, one is impressed by the thought that some data are very well established and the likelihood of change is very small. Other items, however, are unquestionably open for further investigation. It is of interest to note, also, the trend of revision changes. Some decades ago the trend to enlarge the monographs was very marked. At present, and I believe this will hold for the future, the tendency will be to reduce the size of the monographs and to eliminate all statements that are not proved absolutely essential.

The possibility of establishing the fineness of powdered drugs has been a problem of great interest. When it was discovered in our investigations at the University of Minnesota, some time ago, that commercial powders of a designated degree of fineness did not conform to the definitions in the Pharmacopœia for such powder, we started work to determine if these drugs could be reduced to a definite degree of fineness. In the examination by sifting of 1500 samples of powdered drugs, partly commercial and partly produced in the laboratory, we have yet to find a single sample that conforms to the U. S. P. definition. If it is impossible to retain the present U. S. P. definitions of the degrees of fineness of a powder, it is very important to determine the proportions of the different finenesses that go to make up the powder most suitable for percolation or for such other purposes as the Pharmacopœia indicates. The study of these "powder curves" has been taken up and will be pursued in an endeavor to establish data for the next pharmacopœial revision. These "curves" depend upon the type of mill employed, the speed of the mill, the moisture in the drug and other factors. It becomes evident that practically each drug must be dealt with by itself in connection with the problem of reducing it to a powder. It is possible, also, that other means than sifting will need to be employed to determine the fineness of the powder. Some powders are practically unsiftable.

There has been splendid coöperation between the sub-committees on extractive galenicals and the pharmacognosy sub-committee and a schedule of names has been adopted for the designation of the fineness of powders, namely, coarse, moderately coarse, fine and very fine. The proper defining of these four terms is one of the important problems before the pharmacopœial committee. Another problem of great moment is in connection with physiological assays. These probably will be made obligatory for a number of drugs in the present revision. The particular problem that arises is the relation between the toxicity of the drug to small animals and its therapeutic value to man. It has been well demonstrated in connection with digitalis that the toxicity is not altogether conformable to the therapeutic value of the drug. Whether the toxicity of aconite corresponds to this therapeutic value is also a question, but it is sure that aconite which is toxic is of more value than aconite which is not, and samples of aconite yielding by chemical assay a full 0.5 per cent. of alkaloids are known which are neither toxic nor of therapeutic value.

The use of a blanket standard in connection with the inorganic matter in vegetable drugs is an innovation. Such a standard was also suggested for the foreign organic matter, but so little is known on this subject that such a blanket standard was thought inadvisable.

The problem of sampling large quantities of a drug to obtain a representative sample is a very great one, and while progress has been made, it is not as yet really satisfactorily solved.

The question of moisture in drugs needs a very large investigation. The determination and the naming of the color of a drug or chemical in both the whole and powdered form is a problem of great moment. The question of the introduction of a color chart into the Pharmacopœia has been up but has been deferred for further investigation.

In connection with the question of continuous revision of the Pharmacopœia, problems have risen and the idea of appointing special committees and referees to investigate further a number of these problems is being considered.

Probably the revision will be continued throughout the decade in this manner.

Dr. Newcomb's address was very well received and was discussed by Messrs. I. A. Becker, H. C. Christensen, A. H. Clark, A. G. DuMez and E. A. Ruddiman.

E. N. GATHERCOAL, *Secretary.*

THE MINUTES OF THE UNOFFICIAL CONFERENCE OF U. S. P. AND N. F. REVISION WORKERS AT THE UNIVERSITY OF ILLLINOIS SCHOOL OF PHARMACY, JANUARY 12, 1924.

An unofficial conference of the members of the U. S. P. and N. F. Revision Committees and others interested in the work of these committees to consider some of the unsolved problems of the present revision was called under the auspices of the Chicago Branch of the American Pharmaceutical Association at Chicago, January 12, 1924.

Mr. L. E. Warren, President and Mr. E. N. Gathercoal, Secretary of the Chicago Branch of the American Pharmaceutical Association, were elected Chairman and Secretary of the Conference.

The following were in attendance: Dr. E. Fullerton Cook of Philadelphia, Dr. A. G. DuMez of Washington, D. C., Dr. E. L. Newcomb of Minneapolis, Mr. A. John Schwarz of Indianapolis, Dr. George D. Beal of Urbana, Prof. Hugh C. Muldoon, Prof. George C. Schicks and Prof. C. L. Cox of Valparaiso, Dr. E. L. Ruddiman of St. Louis, and Dr. O. V. R. Smith, Prof. Elmer H. Wirth, Prof. Clyde M. Snow, Mr. L. E. Warren, Prof. E. N. Gathercoal, Prof. W. B. Day, Dr. Hugh McGuigan, Dr. Bernard Fantus, Mr. Willaim Gray, Dr. H. W. Vahlteich, Prof. A. H. Clark, Mr. H. H. McCausland, Prof. M. A. Miner, Mr. Alford Hansen, Dr. Carl Neilsen, Mr. C. K. Glycart, Miss Vivian Stuchlik, Mr. J. A. Dorjahn and Dr. J. A. Hynes of Chicago.

The program for the Conference was as follows:

Dr. E. Fullerton Cook—"An Introductory Statement."

Dr. Hugh McGuigan—"The Standardization and Action of Local Anesthetics."

Dr. E. L. Newcomb—"The Designation of the Degree of Fineness of Powdered Drugs."

A. J. Schwarz—"The Sampling of Crude Drugs."

Dr. Bernard Fantus—"Dose Standardization of Elixirs."

Dr. A. G. DuMez—"Official Abbreviations and Other Problems of Nomenclature."

Dr. H. W. Vahlteich—"The Acid Content of the Pepsin Preparations."

Dr. Geo. D. Beal—"Can the Anthraquinone Drugs Be Scientifically Valued?"

Prof. A. H. Clark—"Continuous Revision of the U. S. P. and the Division of the Book into Two Separately Bound Parts."

L. E. Warren—"The Pharmacopœia from the Standpoint of the Analyst."

Dr. Henry Kraemer—"The Color and Odor of Drugs."

DEMONSTRATIONS.

Prof. E. H. Wirth—"The Demonstration of the Scoville Test for Determining the Strength of Capsicum."

J. A. Dorjahn—"Matching Powdered Drugs to a Color Chart."

Miss Vivian Stuchlik—"The Fermentation of Low-Alcoholic Liquid Galenicals."

Chairman E. Fullerton Cook, of the U. S. P. Revision Committee, opened the meeting and said in part: The very successful working out of the conferences of the various sub-committees, as well as of the whole Committee, in connection with the present revision leads me to believe that the work of future revisions will follow more and more along the conference line. The results of the present conference will no doubt be of help and should be placed before both Revision Committees. There is no way to bring about results and expedite a program so well as in conference, where the exchange of views face to face and the give-and-take discussion will perhaps do more in a few moments than weeks of correspondence could accomplish.

The general circulars issued to all of the members of the Committee now exceed 2000 large typewritten pages. Each of the 15 sub-committees has also a large file of similar sized pages—that of the sub-committee on botany and pharmacognosy now numbering 1400 pages.

The sub-committees are each made up of a group of workers interested in the work assigned to their particular sub-committee. These men, under the leadership of their chairman, undertake the actual study of the monographs of the Pharmacopœia. The gifts of time and talent donated to this work by the tireless workers of these sub-committees have, in a number of instances, been supplemented by similar gifts from workers outside of the Revision Committee who have been added to

the personnel of the sub-committees as auxiliaries. The chairmen of these 15 sub-committees constitute the executive committee which has the supervision of the editing of the revised manuscript.

Chairman Cook's introductory address was well received and cleared the field for the presentation of the papers to follow.

Dr. E. L. Newcomb, of the University of Minnesota College of Pharmacy, was next introduced and spoke on the subject of "The Designation of the Degree of Fineness of Powdered Drugs."

Because the present audience was largely in attendance at the meeting of the Chicago Branch the preceding evening, at which Dr. Newcomb discussed the same subject, he abbreviated his talk but stated that the important idea before the Conference was the actual framing of the definitions for the degrees of fineness of powdered drugs. But four degrees of fineness, namely, coarse, moderately coarse, fine and very fine, are recommended for the new Pharmacopœia, and these terms have already been adopted by the sub-committees revising the galenicals. The thought so far expressed in connection with definitions for these terms is that at least 95% of the powder shall pass through a No. 20 sieve for the coarse degree, a No. 40 sieve for the moderately coarse, a No. 60 sieve for the fine, and a No. 80 sieve for the very fine powder.

There is no question but that a problem of great magnitude lies in the determination of the degree of fineness of a drug most suitable for its perfect extraction. It is becoming more evident that each drug must be dealt with individually, as in this respect it is a law unto itself. The principle that the powdered drug should represent the entire drug must be maintained, even though the powder may represent a wide range of degree of fineness. After the best powder curve of the drug in relation to its extraction has been determined, this curve should be the standard for that drug.

Professor A. H. Clark stated that he believed that these definitions should be in as simple a form as possible; that, after all, it made little difference whether the drug was a No. 80 or No. 20 or No. 60 or a mixture of these, provided it was in such form that it could be properly extracted. One essential of the powdered drug is a greater degree of uniformity of its therapeutic activity than is found in the whole drug, and means should be taken to insure this therapeutic uniformity.

Dr. A. G. DuMez, Chairman of the U. S. P. Sub-Committee on Nomenclature, presented a number of titles that had been criticized, and asked for a show of opinion from the audience. After frequent discussion, the following recommendations were approved by the Conference:

Antipyrina—Shall it be changed to "Phenazone," the Br. P. title?—No. Gossypium Purificatum—Shall "Purificatum" be dropped? —No. Magnesii Oxidum Ponderosum—Shall "Ponderosum" be dropped?—No. Sulphur Sublimatum—Shall "Sublimatum" be dropped? —No. Talcum Purificatum—Shall "Purificatum" be dropped?—No. Terra Silicea Purificata—Shall "Purificata" be dropped?—No. Acetanilid—Shall "Acetanilide" be adopted?—Yes. Acetphenetidin—Shall it be changed to "Acetophenetide?"—Yes. Acidum Phenylcinchoninicum—Shall it be changed to "Cinchophenum?"—Yes. Antimonii et Potassi Tartras—Shall it be changed to "Antimonylis et Potassii Tartras?"—Yes. Aqua Ammoniæ and Aqua Ammoniæ Fortior—Shall these be changed to "Liquor Ammonii Hydroxid" and "Liquor Ammonii Hydroxid Fortior?"—No; retain present title. Caffeinæ Sodio-Benzoas—Shall it be changed to "Caffeina cum Sodii Benzoate?"—Yes. Theobrominæ Sodio-Salicylas—Shall it be changed to "Theobrominæ Sodium cum Sodii Salicylate?"—Yes. Chloral Hydratum—Shall it be changed to "Chloral Hydras?"—Yes. Eucalyptol—Shall it be changed to "Cineol?"—No. Hexamethylenamina—Shall it be changed to "Hexamina?"—Yes. Saccharum and Saccharum Lacts—Shall these be changed to "Sucrosum" and "Lactosum?"—Yes. Sodii Boras—Shall this be changed to "Sodii Tetraboras?"—Yes. Oleum Anisi—Shall the English title be "Oil of Star Anise?"—Yes. Benzosulphinidum and Sodii Benzosulphinidum—Shall these be changed to "Glusidum" and "Glusidum Soluble?"—No. Plumbi Oxidum—Shall this be changed to "Plumbi Monoxidum?"—No. Aloes—Shall the title be changed to "Aloe?"—Yes. Cascara Sagrada—Shall the title be changed to "Rhamnus Purshiana?"—Yes. Belladonnæ Folia—Shall this be changed to "Belladonnæ Folium?"—Committee to use own judgment. Oleum Cassiae—Shall this be changed to "Oleum Cinnamomi?"—Yes.

RESOLUTIONS.

The following resolutions were adopted at the Conference:

First—Upon motion by Dr. E. L. Newcomb, a committee was appointed by the Chair for

the study of the definitions of drug powders and the committee later reported to the Conference the following resolution:

After careful consideration of data relative to standards for the uniformity of powdered drugs, this Conference recommends that the U. S. P. Revision Committee adopt standards providing: (1) That at least 95 per cent. of a powder of a designated degree of fineness shall pass through a standard mesh sieve of the degree of fineness indicated. (2) That, in view of the practical impossibility of preparing some drugs into a uniform powder, no specific statement be made on the permissible percentage of powder finer than the sieve indicated but that a statement be added to the effect that the percentage of the powder finer than the designated degree be kept as low as possible. (3) That standards for sieves based on the sieve standards of the U. S. Bureau of Standards be included in the U. S. P. in a table similar to that now given on p. 612.

Second—In connection with the discussion of the use of alcohol in the preparations of medicinal products for internal use Dr. Cook moved that the following resolution be adopted:

Resolved, that this Conference is opposed to the granting of the use of tax-free alcohol in the manufacture of medicinal products, as it is believed that such privilege will not result in cheaper medicines to the patient but will make economically impossible the manufacture of medicinal products containing alcohol by the professional pharmacists of our country and will throw all such manufacture into the hands of a few large interests.

Third—Upon receipt of the sad news of the death of Dr. John M. Francis, Dr. Cook moved that the Conference spend a short time in remembrance of our esteemed friend and coworker. Dr. E. L. Ruddiman, who was in personal association with Dr. Francis for some time, Dr. E. L. Newcomb and others expressed their admiration and appreciation of his fine character and attainments. A resolution of condolence to the family of Dr. Francis was moved and unanimously approved by the Conference.

Fourth—In connection with the address on "Dose Standardization of Elixirs" by Dr. Bernard Fantus, the following resolution was offered by Dr. Newcomb and approved by the Conference:

Resolved, that this Conference recommend to the Revision Committee of the National Formulary that every teaspoonful of each simple medicated N. F. elixir should carry an official average dose of the medicament, provided that is practicable, and that each elixir should be considered by itself.

The papers read by Dr. Bernard Fantus, Dr. Hugh McGuigan, Dr. Geo. D. Beal, Mr. A. J. Schwarz, Dr. Henry Kraemer, Mr. L. E. Warren, Prof. A. H. Clark, Dr. H. W. Vahlteich, Prof. E. H. Wirth and Miss Vivian Stuchlik will be published with the accompanying discussion of each.

E. N. GATHERCOAL, *Secretary*.

CLEVELAND.

The November meeting of the Cleveland Branch of the American Pharmaceutical Association was held at the School of Pharmacy, Western Reserve University, November 27, 1923. Dr. J. C. Placak, the speaker of the evening had for his subject—"Newer Remedies." He outlined briefly the history of medicine from Hippocrates, Galen, Laennec to Pasteur.

The subjects that follow were treated in a way most interesting to pharmacists, as evinced by the approval voiced at the conclusion of the meeting:

1. Tuberculosis, and aside from the agents ordinarily employed in treatment, lung collapse brought about by air pressure exerted in the lung cavity, to permit complete rest of the lung.
2. Protein sensitization in treatment of asthma, eczema, and various skin diseases. Examples of this type of treatment were cases of asthma directly traceable to dog or horse hair, and cases of eczema or other skin eruptions traceable to particular protein—such as egg albumen—where the trouble was removed by desensitizing the patient to the offending substance. It was pointed out that the chief difficulty in the treatment of such cases is in the determination of the particular protein that is causing the trouble.
3. Fighting disease with disease germs. As an example progressive paralysis was cited, and its progressive treatment by inoculating with malaria and following with the quinine treatment, thus eliminating the paralytic tendencies.
4. In addition the following subjects were discussed briefly, with a summary of treatments to date and results obtained:

   Diabetes, especially with reference to insulin.

Cancer, and the use of radium and X-ray.
Anti Sera in pneumonia and cerebral meningitis.
Diphtheria prophylaxis.
Intestinal parasites, with special reference to hookworm disease.
Use of tryparsamide for locomotor ataxia and other diseases of central nervous system.

EDWARD D. DAVY, *Secretary.*

PHILADELPHIA.

The December meeting of the Philadelphia Branch of the American Pharmaceutical Association was held at the Philadelphia College of Pharmacy and Science, Tuesday, December 11, 1923.

The minutes of the meeting of the previous month were read and approved and the reports of committees appointed at the last meeting were then received.

Resolutions on the death of Dr. John F. Hancock were presented and a copy was ordered to be transmitted to the family of the deceased.

Chairman Hunsberger of the Committee on Insulin Distribution then presented the following:

"*Be it resolved,* that the Philadelphia Branch of the American Pharmaceutical Association endorses the general plan followed by the University of Toronto of releasing new therapeutic products for general distribution only after satisfactory clinical evidence of their value as medicinal agents has been proven."

"*Resolved,* that we express our approval of the method followed of distributing therapeutic products through their legitimate channel—the retail pharmacist."

The Branch directed that the foregoing resolutions be entered upon the minutes.

"Browsing through Old Books" was the topic in which Messrs. Ivor Griffith, Ambrose Hunsberger and Charles H. LaWall were the guides.

Dr. LaWall started the program by discussing the ancient writings and picture writings of the Nomadic tribes. He rapidly traced the progress of the conveying of thought from these ancient tribes through what may be probably considered modern writings of the Egyptians on papyrus and the Greeks and Hebrews on parchment. He talked of the many printers who now are famous and the production of their masterpieces. Exhibitions of some of the untiring work of these men were shown including one of a hand printed and illustrated Bible on parchment.

E. G. Eberle exhibited an old Dutch volume on botanical drugs presented to the Association by William Beukma of Denver in memory of his father; also the Book of the Constitution and By-Laws, A. Ph. A., with the signatures of earlier members. He also brought other American medical and botanical books dating back a hundred years.

Other illustrated works were shown, some of which were amusing when compared to what we are pleased to call our present-day knowledge. Illustrations in scientific books, particularly those on botany, were rather imaginative.

Ivor Griffith introduced his part of the program by reading the title page of the Dispensatory of William Penn. He read a number of selections from the book. A paragraph from the title page will serve to indicate the contents of the book.

"The Compleat CHYMICAL DISPENSATORY, in Five Books. Treating of All sorts of Metals, Precious Stones and Minerals, of all Vegetables and Animals and things that are taken from them as Musk, Civet and the like. How rightly to know them, and how they are to be used in Physick; with their several doses."

Thus we see that our good governor had a very complete knowledge in this volume.

The Pharmacopœia Universalis was then discussed by Ambrose Hunsberger. This is a glossary of formulas, many of which are to-day unknown, one which Mr. Hunsberger brought to our attention being a Cosmetic Water composed of bitter almond, rose vinegar, syrup of raspberry, honey and jasmine water. Some of the doses supposed to have been administered, if the directions in the formulary were followed, would to-day cause very dire results.

Several of the members participated in the discussion and the contributors to the program were tendered a vote of thanks.

JOS. W. E. HARRISSON, *Secretary.*

UNIVERSITY OF WASHINGTON.

DECEMBER MEETING.

The regular monthly meeting of the University of Washington Branch was held at Bagley Hall, December 13, 1923, President Shaw presiding. According to the secretary's report 25 new members have been added to the Branch since October.

After the report of the secretary and treasurer, the president introduced the speaker of the evening, Mr. Walter Sedgley, of the Owl Drug Company. Mr. Sedgley is District Manager of the Pacific Northwest and lived up to the requirements of his position during his interesting and instructive talk. Beginning with the procedure necessary to enter the drug business he developed his theme through the fields of buying, selling, stock keeping, inventory, etc. An abstract of his talk would be unfair to the subject as presented, and the details of the talk too lengthy. Only 40 members were present, and of these only a few were from outside the University, in spite of the fact that written invitations were mailed to all the drug stores in Seattle. A second general notice will be sent to all drug stores in February, in an attempt to increase the A. Ph. A. membership list of Seattle.

H. A. LANGENHAN, *Secretary.*

FUND FOR RESEARCH.

The American Pharmaceutical Association has available a sum amounting to $450.00 which will be expended after October 1, 1924, for the encouragement of research.

Investigators desiring financial aid in their work will communicate before March 1 with H. V. Arny, Chairman, A. Ph. A. Research Committee, 115 West 68th St., New York, N. Y., giving their past record and outlining the particular line of work for which the grant is desired.

Detroit Institute of Technology School of Pharmacy, of Detroit, Mich., has been elected to membership in the American Conference of Pharmaceutical Faculties.

BUSINESS OF FAULT-FINDING.

Robert D. Towne recently said—"this is the day of the faultfinder." We are not so certain of that but there is good counsel in saying—"what is needed is red-blooded friendship. There is something for everybody to do in these days besides finding fault, and that is to take hold and help."

A speaker at a recent national meeting is reported to have said—"business men are not included among those who follow professions because of the lack of honor among them and in business generally." There are some other statements relating to business men that he is reported to have included in his address. The *New York Commercial* comments editorially—that "the speaker's belief of the lack of honor in business or among business men would get a severe shock if he could talk with the bankers of this country who come daily in contact with its business men." The editorial refers to some of other classes who once in a while go wrong, but as a rule they are fine and entirely worthy people—the conclusion of the comment is that "it's the same way with the business men of this country." It is not likely that those familiar with the facts were greatly instructed by the speaker; perhaps he had a specific case in mind but, too often, general statements are not answered as they should be; more often they should not be made.

One of the causes leading to general accusations is disregard of law, and that in turn is due to some extent to the multiplicity of laws and would-be reformers. There are men within and without legislative bodies who spend time in devising means for bringing a larger number of people on the Government's and States' pay-rolls. Then there are groups who endeavor to secure special legislation—regardless of the welfare and needs of the public—for selfish, mercenary motives. In doing so they involve others and make them participants in their schemes.

What is needed is a quicker general sense of obligations under existing laws and that, to a larger degree, some of the troublesome enactments be made workable.

NON-SPECIFIC WASSERMANN REACTIONS.

Escomel reports in the *Gaceta Medica Peruana* three cases of extensive alveolar pyorrhea in which the Wassermann reaction was strongly positive, notwithstanding the absence of syphilis. Six species of spirilla, the pneumococcus, the streptococcus and two other bacteria, were cultivated from the gums. Under local neoarsphenamin treatment, the Wassermann reaction became negative. In other cases the misleading Wassermann reaction had been responsible for intensive arsenical treatment which had entailed intestinal, liver and cutaneous lesions from the toxic action of the arsenic. These were ascribed to the nonexistent syphilis, and were treated with more observation; the resentment against the father, as the supposed source of the actually nonexistent syphilis, led to suicide.—*Journ. A. M. A.*, Jan. 26, 1924.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

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THE AMERICAN PHARMACEUTICAL ASSOCIATION HEADQUARTERS BUILDING.

The article of the January issue, page 5, by Chairman James H. Beal, of the Headquarters Building Fund Committee, places before pharmacists and the laity a survey of what the American Pharmaceutical Association has accomplished and speaks of its influence, helpfulness and coöperation. Chairman Beal's résumé of some of the Association's achievements points to the fact that "there is no field of pharmaceutical endeavor in which the Association has not labored diligently and effectively, and there is no individual or institution that produces, buys, sells or uses drugs and medicines that is not indebted to the American Pharmaceutical Association in greater measure than it can ever hope to repay. Its work has been altogether altruistic, without desire or expectation of material reward, and has been accomplished by the self-sacrificing endeavors of a host of earnest laborers." The call of the message is one of duty and to make possible continued work, it presents the opportunity to participate in the following words:

"It is, therefore, altogether fitting that those who have received so much from the Association should contribute to a Headquarters Building, both to serve as a monument to the many unselfish members who have served the cause of pharmacy so efficiently and to provide the facilities that will enable the Association to render still broader and more valuable services to coming generations."

THE U. S. PHARMACOPŒIA IN AN ADVANCED MEDICAL POSITION.

Chairman E. Fullerton Cook, of the U. S. P. Revision Committee, addressed a meeting of pharmacists recently in Chicago on "The Pharmacopœia in the Making." Reference to the address is made in the Chicago report under Local Branches, of this issue of the JOURNAL. An important and interesting statement of the many in the address is "that the activity of the physicians of the Committee has placed the Pharmacopœia in an advanced medical position. The very facts that a group of representative physicians, more than half of whom are constantly practicing at the bedside of patients, have devoted several years to a careful study of every known therapeutic agent and have selected those of inclusion in the Pharmacopœia which they deem dependable and best, insures the medical standing of the new book. With the exception of a very few therapeutic agents which are controlled by patent, the field of materia medica of the entire world was available for selection. The new Pharmacopœia may therefore be accepted by the physicians of the country as representing the best therapeutic agents obtainable and the drugs recognized may be advocated with confidence."

REVISION OF THE DUTCH PHARMACOPŒIA.

The Dutch Pharmacopœia, now being revised, will have a "Purity Rubric." The chapter on general tests for impurities contains descriptions of methods to determine the ab-

sence of color and the clarity of liquids and an interpretation of certain terms as "no residue on incineration," "no residue on evaporation." A liquid is deemed colorless if its tint is not deeper than certain defined solutions for comparison; the tests are to be carried out in tubes of at least 10 cm. length, provided with a flat, colorless base, and the solutions are viewed against a white background. Definitions are given for neutral, acid, faintly acid, alkaline, amphoteric, alkaline to phenolphthalein, neutral to phenolphthalein, etc., etc.

PERSONAL AND NEWS ITEMS.

TESTIMONIAL DINNER IN HONOR OF HENRY V. ARNY, PRESIDENT OF THE A. PH. A.

On the evening of January 14th, at the Hotel Pennsylvania, New York City, a number of Professor Arny's friends tendered him a testimonial dinner in honor of his election to the Presidency of the American Pharmaceutical Association.

A large round table, prettily decorated, was set in the foyer of the small ball room, and after the tasty menu had been disposed of Dr. Horatio N. Fraser proposed an improvised toast to the guest of honor. Mr. Clarence O. Bigelow then made a few congratulatory remarks.

Dean Rusby with well-chosen words called attention to Dr. Arny's activities in the American Pharmaceutical Association and presented him with a handsome gold watch, bearing the following: "Presented to Henry V. Arny, President, American Pharmaceutical Association, 1923–24, by a few of his friends, January 14, 1924."

Chairman Jeannot Hostmann, after a few personal remarks, read and presented the following testimonial which was beautifully engrossed and bound in pin seal leather.

"TESTIMONIAL DINNER IN HONOR OF HENRY V. ARNY, JANUARY 14, 1924.

"Dear Doctor Arny:

"Twenty-seven years ago in sunny New Orleans you charted a course that you have unhesitatingly followed—a course that has meant unremitting labor for the betterment of your chosen profession.

"As organization worker, teacher, research worker, author and editor you have toiled without rest. Every field of pharmacy has been enriched by your efforts.

"Your fellow members have bestowed upon you the highest honor—the presidency of the American Pharmaceutical Association.

We, a few of your many admiring friends, present this as a reminder of this occasion.

(Signed)

William C. Anderson	Hugo Kantrowitz
Charles W. Ballard	J. Leon Lascoff
Clarence O. Bigelow	Robert S. Lehman
David Costelo	Henry C. Lovis
Turner F. Currens	Joseph L. Mayer
George C. Diekman	Harold McAdams
Jacob Diner	Otto P. McCanis, Sr.
Moritz Dittmar	Charles J. McCloskey
Reginald Dyer	Leon Roon
Clyde L. Eddy	Henry H. Rusby
Robert P. Fischelis	Hugo H. Schaefer
Horatio N. Fraser	Leonard W. Steiger
Robert R. Gerstner	Richard H. Timmerman
Charles W. Holton	Theodore Weicker
Jeannot Hostmann	Curt P. Wimmer"

The gathering then adjourned and the participants proceeded to the meeting of the New York Branch of the American Pharmaceutical Association, which was held in the new library of the New York College of Pharmacy, where President Arny delivered a "Message from The American Pharmaceutical Association."

DR. ALBERT SCHNEIDER LOST VALUABLE MANUSCRIPTS IN THE BERKELEY FIRE.

Dr. Albert Schneider, Dean of the School of Pharmacy of North Pacific College, Portland, Oregon, lost valuable manuscripts in the Berkeley, California, fire of last September, including the manuscript on "Applied Therapeutics" practically ready for the publisher, a full report on "The Use of Emetin in the Treatment and Prevention of Cancer," his notes on cancer experiments, the drawings, notes and manuscript on Mexican Bitter Bush (*Castela Nicholsoni*) and the notes, drawings and manuscript on "The Use of the Compound Microscope in Detective Work." The drawings were made by his daughter, Elsbeth. Some four hundred volumes belonging to the family library were also destroyed. Personal belongings, which were hastily packed into suit cases, were taken by looters. The loss was complete. Dr. Schneider especially regrets the loss of the notes, drawings and manuscript on Bitter Bush, the work on which was made possible by the A. Ph. A research grant for 1922.

Prof. Otto Raubenheimer celebrated the fiftieth anniversary of the drug store, for many years—"Verona Pharmacy," by putting in a new store front which he designed. The front has a black and gold marble base, 5 show windows with colored glass above the ceiling; the floors of the show windows are of white tile, the lighting is artistic and the effect

with signs and show globe conforms to that of a professional pharmacy which this pharmacist maintains.

Miss Frances M. Greenwalt is the pharmacist in charge of the pharmacy work at St. Luke's Hospital, St. Paul. She also teaches classes of nurses in the Hospital Training School and is a vice-president of the Minnesota Pharmaceutical Association.

Dean Charles H. LaWall has been elected a councilor of the American Chemical Society, Philadelphia Section, and appointed a member of the Society's committee to confer with one of the American Medical Association on Laboratory Legislation. Dr. Julius Stieglitz of Chicago and Charles L. Parsons of Washington are the other two members of the A. C. S. Committee.

Pennsylvania is setting apart "forest monuments." As an example, there is a reserve of twenty acres named the "Joyce Kilmer State Forest Monument." It is in Union County, and thousands of Americans have raved over scenery less beautiful, which they traveled to Norway or Switzerland to see.

It is Pennsylvania's memorial for the young American poet who died in the World War. Upon a tablet is written his fine poem, "Trees." Joyce Kilmer's monument is a wonderful grove of primeval hemlocks and white pine. Among our members it is quite generally known that the parents of the honored are **Dr. and Mrs. Frederick B. Kilmer,** of New Brunswick, N. J.

J. T. Lloyd, son of Ex-President John Uri Lloyd, and Dr. A. A. Allen, professor of Zoölogy at Cornell, were marooned from January 19–21 in a small motor boat, left dry about twenty-four miles from Galveston, between Alligator Point and Christmas Bay, by the receding tide. They were rescued by Dr. E. L. Fox and A. B. Reiler of Houston, members of the party collecting data for a classification of birds of the United States.

Charles J. Lynn, general manager of Eli Lilly & Co., accompanied by Mrs. Lynn, is on a trip around the world; they spent Christmas in China.

Warren L. Bradt, secretary of New York State Board of Pharmacy, is wintering in Miami, Fla.

Edward Victor Zoeller adorns the January *Carolina Journal of Pharmacy*. The issue is affectionately dedicated to him as the most distinguished pharmacist of North Carolina—"In appreciation of his kindliness of manner, modesty of mien, and broadness of character; in recognition of his long-sustained, self-directed and result-producing efforts on behalf of Pharmacy; and as a tribute which bespeaks the warm regard in which he is held by every druggist of the State."

President Charles W. Johnson, of the American Conference of Pharmaceutical Faculties, attended a meeting, in Buffalo, of the committee which is considering the proposed survey of pharmacy by the Commonwealth Fund under the direction of Dean W. W. Charters, of the Carnegie Foundation.

Prof. E. E. Stanford has been given leave of absence by Western Reserve University and is studying at Harvard.

W. C. Wendt, of Columbus, is serving his second term in the Ohio Legislature. He contends that much of the trouble to which pharmacists have been subjected is due to their apathy. He speaks in no uncertain terms appreciatively of the work of Secretary **Theodore D. Wetterstroem.**

George A. Newman founded the Newman Drug Company, Louisville, Ky., in 1867, the year after affiliating with the A. Ph. A., and continued his membership for more than fifty years. He died a few years ago and our fellow-member, Addison Dimmitt, is now the president of the company. A clear plate glass in a gilt frame, 6 ft. by 14 ft., partitions the prescription department and through this the customers see the white clad pharmacists in a busy, carefully kept prescription department.

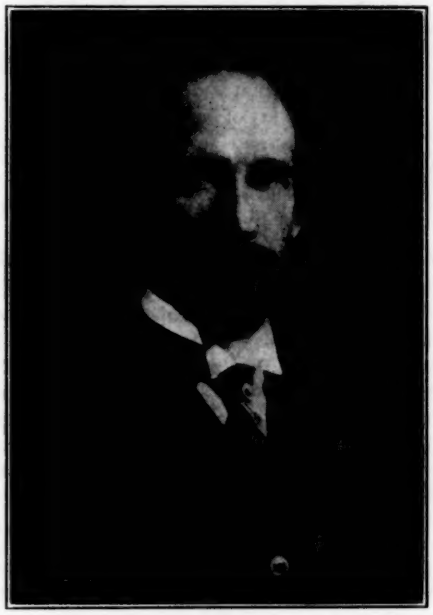
B. C. Goodhart, a former president of the Philadelphia Branch, A. Ph. A., has been elected president of the Philadelphia Association of Retail Druggists.

Caswell A. Mayo presented an illustrated lecture, "The Great Botanic Gardens of the World," before the students of the Eclectic Medical College. He accentuated the importance of these gardens by the service of gardens at Kew, Calcutta and Java, which brought Cinchona culture to the East Indies. He urged the need of the establishment of an adequate botanic garden at Washington and of a municipal garden in Cincinnati.

Henry Watters, one of our Canadian members, and who has been engaged in the drug business in Ottawa, Canada, for nearly half a century, was elected Mayor of Ottawa at the recent municipal elections by a large majority. Mr. Watters is proprietor of the Standard Drug Co., and a member of the Council of the Ontario College of Pharmacy.

OBITUARY.

Dr. John M. Francis, whose death, January 8, was recorded in the last issue of the JOURNAL p. 86, was born in Jacksonville, Ala., October 25, 1867.



JOHN M. FRANCIS.

For thirty-two years Dr. Francis was connected with Parke, Davis & Company, during the past twenty years as chief chemist, a position of trust and of great responsibility. He was twice a member of the Revision Committee of the U. S. P.; was a member of this committee, as well as chairman of the Committee on Pharmaceutical Research of the National Research Council, at the time of his death. He was active in church work, kind, modest and courteous.

He received his education at the University of Alabama and at Johns Hopkins. He is survived by a wife, a son and a daughter. Permanent interment will be made at his old home in Alabama.

Dr. Francis was a man of unusual ability who visioned broadly and worked quietly in the interests of pharmacy and chemistry. He was uncompromising in his attitude toward low standards and preparations of uncertain merit, and in this way he has left his impress for all time on American pharmacy. He was a fluent speaker, ready at a moment's notice to take up almost any subject and hold the attention of an audience. His counsel was always helpful; he was generous with his information and knowledge, kind and courteous always.

SOCIETIES AND COLLEGES.

THE A. PH. A. HEADQUARTERS MOVEMENT PROGRESSING.

Publicity Editor, E. L. Newcomb, has entered on his work in preparing publicity that will inform retail pharmacists relative to the movement now well under way. The laity supply the means for carrying on investigations in the medical fields; their interest can be aroused for a proposition of this kind which, in a way, is one of the links of a chain of effort for alleviation of disease, better health conditions, providing new and better remedial agents.

Chairman H. A. B. Dunning has been eminently successful in business; he knows every side of pharmacy. He knows how to put over big propositions; he has done so before. Few fully realize, at this time, what the offer of Chairman Dunning means in the way of sacrifice for him; it adds hours to his busy day, but he is willing to give his time and that of others of his firm, because he realizes that the accomplishment means more than simply establishing the headquarters; it means a higher standard for pharmacists, greater confidence in the mission of pharmacy, and enlarges its services. Share the enthusiasm, willingness and purpose of the chairman and bring about success quickly!

The need for a headquarters building has been well set forth by Chairman James H. Beal in the January 1924 number of the JOURNAL, pp. 5 and 6. The message is one of encouragement; it conveys not only history of accomplishments by the American Pharmaceutical Association, but shows the way to further success. The headquarters building will provide great opportunities—one research laboratory has already been provided for. It is a real big national undertaking of American pharmacy, in the success of which you will have joy and satisfaction. Give according to the enthusiasm of those who are leading the movement; let other industries see that phar-

macists have determination, have faith in the mission of pharmacy. For after all, the laity judge the value of a business or profession by the estimate those engaged therein place upon it, their willingness to give a lift.

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS TO MEET IN WASHINGTON, D. C.

The annual meeting of the National Association of Retail Druggists will be held in Washington, D. C. The date of meeting will be fixed by the executive committee, probably at its next session.

AMERICAN PHARMACEUTICAL MANUFACTURERS.

The American Pharmaceutical Manufacturers' Association will hold their annual meeting at French Lick Springs, June 2–7. Extensive plans are made for the business and entertainment features of the convention.

The officers and directors of this association are: President, R. M. Cain, Indianapolis; vice-presidents, William H. Rorer, Philadelphia, and Don. C. Westerfield, Dayton; secretary-treasurer, Ralph R. Patch, Boston, Mass. Board of directors: C. C. Doll, L. H. Nason, Harry Noonan, C. N. Angst, Dr. C. H. Searle, Carroll D. Smith, George C. Pratt, S. DeWitt Clough, J. H. Foy.

THE SPECIAL MISSION OF THE CHICAGO VETERAN DRUGGISTS' ASSOCIATION.

Frater James H. Beal has outlined the special mission of the C. V. D. A. which is "to put the spirit of Christmas into the whole year, and to make good-will toward men a continuing circumstance throughout the entire three hundred sixty-five and a quarter days of the annual calendar.

"Some men find their religion in the formulas of ancient creeds which assert belief in what nobody believes, and none less so than those who profess belief, but according to which if other men do not profess to believe in they shall be damned."

Quotations accompany the discourse, all of them sustaining the subjects of the text and well worth a place on the daily calendar. The last four follow:

The Daily Lesson:

"God is not to be worshipped with sacrifices and blood; for what pleasure can He have in the slaughter of the innocent? But with a pure mind, a good and honest purpose. Temples are not to be built for Him with stones piled on high; God is to be consecrated in the breast of each."—SENECA.

The text for the discourse:

"Slave to no sect, who takes no private road,
But looks through Nature up to Nature's God."—POPE.

The final hymn:

"So many gods, so many creeds—
So many paths that wind and wind
While just the art of being kind
Is what this sad world needs."—ELLA WHEELER WILCOX.

Closing with the Benediction:

"Cheers for the living; tears for the dead."

MAINE PHARMACEUTICAL ASSOCIATION.

The mid-winter meeting of the Maine Pharmaceutical Association is being held in Augusta on the 14th of this month. The Publicity Committee for the year is composed of Joseph Dow, Portland; Joseph Young, Augusta; C. H. Davis, Bangor. The date of the annual meeting has been fixed for September 24 to 27, at Poland Springs.

MICHIGAN BOARD OF PHARMACY.

The pharmacy and drug laws of Michigan with rules and regulations for their enforcement have been compiled under the supervision of the Michigan Board of Pharmacy. The book has 117 pages and a valuable part of the compilation is that synopses of court decisions are given, thus enabling the lay member to interpret the laws. It represents a very valuable work, not only for the pharmacists of Michigan but of other States, and the idea may well be taken up by other State boards of pharmacy and associations. The Michigan Board of Pharmacy is composed of Jacob C. Dykema of Grand Rapids, president; Oscar W. Gorenflo, Detroit, vice-president; J. A. Skinner, Cedar Springs; Claude F. Jones, Battle Creek; James E. Way, Jackson; H. H. Hoffman, Lansing, director.

MINNESOTA PHARMACEUTICAL ASSOCIATION.

The Minnesota Pharmaceutical Association is assembled in convention during this week, namely, from February 12th to 14th. Great preparations have been made for the meeting and a large attendance is expected. Among the speakers will be George Judisch, Samuel C. Henry, and quite a number of others who are prominent in State and national affairs.

Minnesota druggists are quite well pleased with the official bulletins that are formulated by the Northwestern Pharmaceutical Bureau, National Drug Trade Board of Public Information and other agencies. The bulletins used by the druggists of Minnesota relate particularly to items of special interest in the State, though not limited to such matters. Bulletins of more general information are also used in Minnesota as well as in other States. The bulletins of immediate interest are those relating to State association meetings. Those of more general information and used by different States relate to such items as misuse of the word "Drug," "The Druggist is More than a Merchant," "The Druggist a Public Convenience," "Information Relative to Anti-freeze Mixtures," etc. Most interesting information should come from the questionnaire sent out through the Northwestern Pharmaceutical Bureau on "The Prescription Department." Information is asked for relative to the number of prescriptions filled, the refills, what efforts are being made to induce dispensing physicians to write prescriptions, whether the prescription business is increasing or decreasing, how prescription prices are determined, what books should be in the library of a pharmacy, etc.

NEW JERSEY PHARMACEUTICAL ASSOCIATION.

The annual mid-winter dinner of the New Jersey Pharmaceutical Association was held at the Masonic Club in Jersey City, February 6th. The Hudson County members arranged the program and Frank O. Cole, the veteran druggist of Jersey City, welcomed the guests. Secretary Jeannot Hostmann gave an outline of legislative matters of interest to the members of the association. About 300 were in attendance.

OHIO PHARMACEUTICAL ASSOCIATION.

Secretary Theodore D. Wetterstroem is making a strong effort to increase the membership of the State association. Included with the letter is a list of many reasons why druggists should join the State association; practically all of them refer to the work that the organization has already accomplished. The association is pledged to support price maintenance bills and members are requested to write Ohio senators and congressmen to support the bills now in Congress and to remove all "nuisance taxes." The Midwest Drug and Health show will be held in the Coliseum in Columbus from April 21 to 26. The service of the drug store to the community is to be emphasized at the show. Druggists in various cities of Ohio are using the coöperative plan of advertising.

RHODE ISLAND PHARMACEUTICAL ASSOCIATION.

The 50th anniversary of the Rhode Island Pharmaceutical Association is to be celebrated on July 25. The association has indorsed the project of the Ways and Means Committee of the new College of Pharmacy to obtain funds for the equipment of the building. The association is in favor of the Mellon plan for a reduction of taxes, and holds that war taxes on an item so essential in the manufacture of medicine as alcohol places a burden on the sick and disabled. The officers of the association are: President, Franklin N. Strickland, Johnston; vice-president, Herbert Haines, Providence; treasurer, John J. Pastille, Providence; secretary, William Shallcross, Pawtucket. The executive committee is composed of Arthur W. Boston, Joseph L. McDonald and Charles F. Gilson, all of Providence.

BOSTON RETAIL DRUGGISTS' ASSOCIATION.

The annual meeting of the Boston Retail Druggists' Association was held January 22nd at Young's Hotel. The guest of honor was President Frank G. Allen, of the Massachusetts State Senate. The following officers were elected: President, C. Fred Wright; treasurer, C. Herbert Packard; secretary, Walter R. Dolliver; executive committee, Theodore J. Bradley, chairman, A. H. Bartlett, F. S. Rogers, W. H. Glover, J. R. Sawyer, G. E. Whittaker and C. C. Hearn.

DALLAS RETAIL DRUGGISTS' ASSOCIATION.

The annual meeting of Dallas County Pharmaceutical Association was held at the Medical Arts Building in Dallas. The membership of the Association is 145. The following are the officers: President, R. N. Connell; vice-presidents, R. N. Clark and James Drake; secretary-treasurer, J. T. Covington. The Board of directors consists of the following: N. E. Florence, Chairman; L. O. Donald, Charles R. Smith, A. J. Urbish, H. S. Forman,

James T. Drake, W. M. Greinstaff, Sam Y. Althoff, Charles Hamilton, Roy Skillern, D. B. Blaine and C. B. Allison. Dallas County druggists are doing coöperative advertising. The subjects that are given publicity are related to general interests. Attention is called to the State pharmacy laws and that every druggist must be registered under the law. Attention of the public is also directed to the prevalence of stores which have other objects than serving the public with medicines and should not be encouraged. Other advertisements and bulletins relate to the service of pharmacists and the care necessary in handling medicines and compounding prescriptions.

PHILADELPHIA ASSOCIATION OF RETAIL DRUGGISTS.

The following officers were elected at the annual meeting by the Philadelphia Association of Retail Druggists: President, B. C. Goodhart; vice-presidents, Harvey L. Wertley, John J. Kelly, Leonard E. Greenberg; secretary, Otto Kraus; treasurer, G. W. Fehr. The executive committee is composed of the following: F. R. Keller, J. W. Noble, Frank Taylor, W. B. Hibbs, B. E. Blankenbush, R. T. Blackwood, A. G. Keller, J. C. Walton, Quintus Hoch, H. J. Siegfried, A. Y. Gerhard, J. S. Simpers, M. F. Powers and B. G. Clapham.

DRUG AND CHEMICAL SECTION, NEW YORK BOARD OF TRADE AND TRANSPORTATION.

The following officers were elected at the annual meeting of the Drug and Chemical Section, New York Board of Trade and Transportation: Chairman, Edward Plaut; vice-chairman, Charles L. Huisking; treasurer, William A. Hamann; secretary, William F. McConnell; Director to represent the section, Frank C. Starr; executive committee, Clement Speiden, Theodore H. Day, Edward Zink, Carroll Dunham Smith, and A. Bakst.

PHILADELPHIA DRUG EXCHANGE.

The Philadelphia Drug Exchange elected the following officers at the annual meeting held January 22nd: President, Milton Campbell; vice-president, Miers Busch; secretary, Joseph W. England; treasurer, A. L. Hilles, Jr. The Board of directors is composed of the following: Charles E. Hires, Herbert R. McIlvaine, Adam Pfromm, C. Stanley French, John F. Belsterling, F. L. Bodman, Walter V. Smith and C. Mahlon Kline.

President Charles E. Hires in his address commended the reduction of taxes, the better enforcement of the provisions of the 18th amendment, and hoped that Congress would pass a bill subsidizing our merchant marine. In a brief but general way the business of the past year was reviewed. The subject touched upon in the address of President Hires was discussed more fully by other members and was made part of the report at the annual meeting. This has been printed under the editorship of Secretary Joseph W. England. The subjects of the report are as follows: "Annual Message," by President Charles E. Hires, "Report on Business and Financial Conditions," by Secretary Joseph W. England. Reports on Conditions in the Drug, Chemical and Allied Industries are discussed by the following: "Legislation," C. Mahlon Kline; "Crude Drug and Drug Milling," Herbert R. McIlvaine; "Medicinal Chemicals," F. L. Bodman; "Heavy and Technical Chemicals," Alexander C. Ferguson, Jr.; "Volatile Oils," J. F. Pound; "Pharmaceuticals and Biologics," Milton Campbell; "Proprietary Goods," Miers Busch; "Paints, Oils and Varnishes," C. Stanley French; "Advertising and Selling," Harrison S. Hires; "Accounting, Credits and Collections," Walter E. Smith; "Liabilities and Compensation," Adam Pfromm; "Fire Insurance," A. L. Hilles, Jr.; "Pharmaceutical Research," Charles H. LaWall.

The annual dinner was held at the Bellevue-Stratford, January 24th. The menu was of the usual excellence. The entertainment features consisted of music, a number of vaudeville acts and a moving picture through the courtesy of H. K. Mulford Co., "The Land of No Regrets." The speaker of the evening was Dr. Wilmer Krusen. He discussed the projects of the Philadelphia Health Department of which he is the head and suggested means whereby druggists can be helpful. Before the close of the evening's entertainment Mayor W. Freeland Kendrick was introduced and made a brief address; he asked for coöperation in carrying out the program of the Mayor's office. The entire program was pleasing and enjoyed by a large number of members, guests and visitors; among the latter was C. H. Waterbury, secretary of the National Wholesale Druggists' Association.

ST. LOUIS COLLEGE OF PHARMACY'S FREE LECTURE COURSE.

A course of free lectures for the benefit of the public, alumni and students was inaugurated

by the St. Louis College of Pharmacy on January 16, by Ellis Fischel, M.D., visiting surgeon of Barnard Skin and Cancer Hospital, who spoke on "The Early Recognition and Prevention of Cancer." Other lectures scheduled are: February 20—Warren R. Rainey, M.D., lecturer on accidents and emergencies, St. Louis College of Pharmacy, "What to Do until the Doctor Arrives;" March 19—Augustus G. Pohlman, M.D., professor of anatomy, St. Louis University, "Deafness—a Problem in Prevention Rather than in Cure." The lectures are held in the college building.

GOLDEN JUBILEE OF THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

The members of the National Wholesale Druggists' Association in Greater New York, at a meeting at the Drug and Chemical Club on January 17th, elected Harry J. Schell, general manager of the *Oil, Paint and Drug Reporter*, chairman of the committee on arrangements and entertainment for the Golden Jubilee meeting of the association to be held in Atlantic City during the latter part of September or early in October 1924. Vice-chairmen were selected representing Philadelphia, Baltimore and Newark, as follows: Philadelphia, Walter V. Smith; Baltimore, H. H. Robinson; and Newark, W. C. Kuebler. The selection of hotel and fixing of dates will be made in the near future by the chairman and vice-chairmen together with C. H. Waterbury, secretary of the association.

HUMANNESS IN BUSINESS RELATIONS WITH EMPLOYEES.

Frank B. Copley writes interestingly in the *American Magazine* for February, of William T. Grant, who has not passed the half-century period and has achieved a success in less than twenty years that has placed him among leaders in chain store systems. Mr. Grant says "this is an age of coöperation, of working together, and an executive cannot demand the coöperation of the people under him. He must win it. He must make them want to work with and for him. And he can do this only as he humanizes himself.

"To humanize yourself you must keep in mind always that other people have feelings, hopes, desires, rights, and aspirations similar to your own. In this way you will become loyal to other people as a matter of instinct. Some executives make the mistake of thinking that loyalty works only one way—from the bottom up. Either it works both ways or not at all. And it must begin at the top. The best executive, in fact, is not one who toadies to the people over him, but one who caters to the people under him."

THE PHARMACIST AND THE LAW.

TRADE ORGANIZATION MAY COLLECT BUT NOT DISTRIBUTE GENERAL DATA ON OUTPUT, SALES AND PRICES.

Pursuant to an inquiry propounded early in December by Secretary Hoover, of the Department of Commerce, Attorney-General Daugherty has made public a statement of his official attitude toward the collection, distribution and use of statistical data by trade associations.

The Attorney-General admits the importance to the members of an industry of information respecting its rate of production, volume of sales, prevailing prices, and so on. He believes that the trade association may function legally, as it can economically, to collect such data. He opines, however, that any distribution or interchange of data as to individual producers or sellers should be prohibited, and that no distribution should be left to the trade association.

JURY HOLDS WILLIAM H. ANDERSON GUILTY OF FORGERY AND MISAPPROPRIATION OF FUNDS.

William H. Anderson, state superintendent of the Anti-Saloon League, was found guilty by a jury, January 29th, on both counts of the indictment charging him with third degree forgery and misappropriation of funds of the League.

DRUGGISTS' TAX ILLEGAL.

The statute requiring a license fee of druggists for selling spirituous and vinous liquors has been definitely repealed by the prohibition acts of 1920 and 1922, the court of appeals held, in denying the appeal of John J. Craig, State auditor of public accounts, Kentucky, who sought a reversal of the judgment of the Franklin circuit court in favor of J. W. Renaker, druggist.

WOULD DECIMALIZE WEIGHTS SYSTEM.

Senator King, of Utah, on January 17, offered in the Senate a bill to rectify, coördinate and decimalize the weights and measures of the United States.

The bill provides that the foot shall be the linear base for weights and measures. The ounce is defined as the weight of a cube of the tenth of a foot of water at the maximum density, and the fluidounce as the volume of the cube of the tenth of the foot, thus producing 1000 ounces to the cubic foot. The pint is defined as the volume of the pound weight of water which makes the pint the precise tenth of the British Imperial gallon.

$150,000 MORPHINE SEIZED.

Morphine valued at $150,000 was found concealed in the panelled walls of the chief electrician's room aboard the Italian steamship Colombo from Naples, by customs agents January 24. Salvatore Scodalro, chief electrician, was arrested.

ALCOHOL TAX CUT IS VOTED AGAINST.

The House Committee on Ways and Means, January 25, voted decisively against the proposed reduction or repeal of the tax on alcohol used for manufacturing purposes. This action was, however, only tentative.

The Ways and Means Committee has been receiving letters and telegrams, petitions and protests relating to the alcohol tax at the estimated rate of 50 a day. There are many communications on both sides of the question, but examination of the files of the committee indicates that communications supporting reduction of the alcohol tax or its repeal outnumber the protests against such action at the rate of more than two to one.

A majority of State pharmaceutical associations have wired or written to their representatives or members of the Ways and Means Committee urging repeal or reduction of the tax. Those opposing the reduction of the tax on alcohol contend that the saving to the patient would be small; the loss to the manufacturers on stock on hand would be large.

An anomalous condition obtains relative to alcohol taxation—a preparation for *external application* may be made with denatured alcohol costing less than a dollar per gallon; the same preparation for *internal use* would have to be made with tax-paid alcohol, costing about $5 per gallon. A related condition obtains in perfume manufacturing.

PRICE MAINTENANCE HEARINGS ARE BEING DELAYED.

There are many important matters in Congress which are delaying the hearings on price maintenance measures and, also, the chain and department stores are opposing the measures. It will be necessary to stimulate the interest in the measures if they are to be passed. Delay of hearings may again result in failure to standardize prices. Members of the House Committee on Foreign and Interstate Commerce should be communicated with promptly, even though it may be a follow-up communication. There are 21 members on this committee; all of them can be addressed care of the House Office Building. The names of the members and States represented follow: Samuel E. Winslow, chairman, Massachusetts; James S. Parker, New York; John G. Cooper, Ohio; Edward E. Denison, Illinois; Everett Sanders, Indiana; Schuyler Merritt, Connecticut; Carl E. Mapes, Michigan; William J. Graham, Illinois; Walter H. Newton, Minnesota; Homer Hoch, Kansas; Adam M. Wyant, Pennsylvania; Olger B. Burtness, North Dakota; Alben W. Barkely, Kentucky; Sam Rayburn, Texas; George Huddleston, Alabama; Clarence F. Lea, California; Harry B. Hawes, Missouri; Tillman B. Parks, Arkansas; Robert Crosser, Ohio; Ashton C. Shallenberger, Nebraska; Parker Corning, New York.

VIRGINIA LEGISLATURE IS CONSIDERING AMENDEMENTS TO VIRGINIA LAW.

Senate bill No. 96 in Virginia Legislature seeks to amend and reënact legislation pertaining to pharmacy. The bill defines the word "drug," term "pharmacy," "patent and proprietary medicines," etc. Pharmacies and pharmacists are to be registered; provision is made for revoking licenses, for sale of domestic remedies in stores other than pharmacies; only pharmacies can use the sign or designation, "pharmacy" "drug store," "prescriptions compounded," etc. A pharmacist to be registered must be a graduate of a school of pharmacy, approved by the State Board of Pharmacy.

Miss Cornelia Cunningham, of Atlanta, has received a civil service appointment as pharmacist with the U. S. Veterans Bureau at Knoxville, Tenn. She formerly was pharmacist at the Davis-Fischer Sanatorium, of Atlanta.

BOOK NOTICES AND REVIEWS.

Handbuch der Pharmakognosie (Handbook of Pharmacognosy). By A. Tschirch. Volume III, Part I. Pp. IX and 748, with 189 illustrations in the text, 13 plates, 1 map and 1 table. Published by Chr. Herm. Tauchnitz, Leipsic, 1923.

Nearly four years have now elapsed since the writer had the pleasure of presenting a notice of the above-mentioned work, of which two volumes had at that time appeared (THIS JOURNAL, 1920, Vol. IX, p. 553). In the meantime the work has been extended in such a manner as to include a number of drugs which had not previously received consideration, and the first part of Volume III has recently been completed. The occasion is therefore opportune for again bringing to notice the compendious Handbook on which so many years of labor and literary research have been bestowed, as also more particularly for indicating the contents of that part of the third volume which is now available.

In the first part of the volume now under notice the author has described a large number of drugs which are classified in three principal groups. These are designated, respectively, as I. Phloroglucin drugs (Taenicide drugs); II. Tannide drugs, or those which contain a large proportion of tannin; and III. Alkaloid drugs. The last-mentioned group is subdivided into a large number of sections in accordance with the constitution or chemical derivation of the respective alkaloids, when this is known, and this group occupies by far the larger part of the subject-matter of the present volume. In the description of the drugs the same general plan has been followed as in the preceding volume, and there are numerous interesting and instructive illustrations as well as abundant citations of the literature.

With a work of such magnitude as the Handbook of Pharmacognosy it is impossible within the scope of a brief notice to convey an adequate idea of its comprehensiveness or the amount of information it contains. On account of this extended character of the work it is also not to be considered remarkable that some of the literature pertaining to particular subjects should have escaped notice. Under drugs obtained from the *Liliaceae* and *Amaryllidaceae*, p. 713, it is stated, for example, that the bulbs of the East Indian plant *Gloriosa superba*, Linné, contain "Superbin," a name given by Warden in 1880 to its bitter principle. It was shown, however, in a publication by Clewer, Green and Tutin (*J. Chem. Soc. Lond.*, 1915, 107, pp. 835–846) that the active principle of this drug is the alkaloid colchicine, which was obtained in a pure crystalline form and completely identified. This observation was of particular interest, inasmuch as colchicine had hitherto only been known to occur in Colchicum. In connection with the last-mentioned subject (p. 713) the work of Ewins on narcissine, from the common daffodil, may be noted (*J. Chem. Soc. Lond.*, 1910, 97, pp. 2406–2409), as also the isolation of the same alkaloid by Tutin from the bulb of the South African plant *Buphane disticha* (*J. Chem. Soc. Lond.*, 1911, 99, p. 1244). Under *Cortex Erythrophlei* or "Sassy Bark," on page 734, a reference might be made to its chemical examination by Power and Salway, which is more recent than any of the investigations noted (*Am. J. Pharm.*, 1912, 84, pp. 337–351).

The few amplifications of the text, such as those above noted, which have been suggested by a somewhat casual survey of the contents of the Handbook, are of relatively little significance when compared with the vast field of literature that has been covered by the compilation. The work constitutes an enduring monument to the learning and industry of its author and will long maintain its value as a source of information on all matters pertaining to the history, collection, description and constituents of drugs. It should therefore be available to all who are interested in the subject of pharmacognosy in its various aspects and applications. F. B. POWER.

Allen's "Commercial Organic Analysis," 5th Edition, Editors: Samuel S. Sadtler, S.B., Elbert C. Lathrop, A.B., Ph.D., and C. Ainsworth Mitchell, M.S., F.I.C. Volume I. 104 illustrations. 8vo. VIII + 796 pages. P. Blakiston's Son & Co., Philadelphia. Cloth, $7.50.

In this 5th edition many of the older and more or less obsolete analytical methods have been deleted. The 4th edition was published in 1909. Since that time much progress has been made in perfecting old methods and in devising new ones. Many of the latter have been incorporated in the revised edition.

The general arrangement of the previous edition is followed rather closely. The title of the chapter devoted to the "organic acids" has been changed from "Acid Derivatives of Alcohols" to the "Aliphatic Acids." The

number of references has been greatly increased and brought down to date.

Chapter I, comprising the introduction and general physical and chemical analytical methods, has been rewritten by William A. Davis, B.Sc., A.C.G.I., Cheshire, England. "Alcohols" is the title of Chapter II and its author is L. M. Burghart, B.A., M.A., Baltimore, Md.; Julian L. Baker, F.I.C., England has revised Chapter III, "Malt and Malt Liquors." Chapter IV, "Wines and Potable Spirits," has been rewritten by Lewis Eynon, B.Sc., F.I.C., London, England, while Emil Schlicting, Ph.D., New York, has revised Chapter V on "Yeast."

Henry Leffman, M.D., Ph.D., Philadelphia, is the author of Chapter VI, "Neutral Alcohol Derivatives" and the author of Chapter IV is also responsible for the Chapter on "Sugars," known as No. VII. "Starch and Its Isomerides" is the title of Chapter VIII, written by T. H. Pope, B.Sc., F.I.C., Cheshire, England. E. Sutermeister, S.B., Westbrook, Me., is the author of Chapter IX, entitled "Paper and Pulp Testing." The last chapter, "Aliphatic Acids," has been rewritten by Hugo Schlatter, B.S., M.S., of Wilmington, Delaware.

A work of this kind, more or less cyclopoedic in character, is rather difficult to review. A few examples will show how well the revisors have succeeded in bringing the work down to date.

Under "Methyl Alcohol," one finds that not only have several tests and methods been deleted and more modern and satisfactory ones included, but the discussion and criticism of them by the author are of untold value. In common with all other chapters, the analyst finds here a very extensive and satisfactory list of references. The modification of the "Vorisek Chromic Acid Oxidation Method," found on page 95, appears to be very satisfactory.

The tests for the examination of ether take up more than twice the space devoted to this subject in the previous edition.

The Chapter on "Paper and Pulp Testing" is written in such a manner as to make it particularly valuable to the analyst only occasionally working along these lines.

The foregoing are indications of the thorough and careful revision one meets with in every chapter or section of the volume.

It appears strange that in such a carefully prepared and comprehensive chapter as that on "Sugar" no mention should be made in the part devoted to urinalysis to the "Quantitative Benedict Modification" of Fehling's Solution, although the qualitative method is given. This is particularly strange as the former has come into great vogue among clinical chemists and pathologists. Furthermore, authors should never fail to direct attention to the fact that the two solutions are quite different, and that the "quantitative" solution cannot be used for "qualitative" work and *vice versa*.

With reference to quantitative work, the reviewer prefers the term "determination" to "estimation," which is used practically throughout the work.

This slight criticism certainly will not detract from the great value of this deservedly popular work without which the reference library of any research or commercial laboratory would be a poor one indeed.

JEANNOT HOSTMANN.

Le Livre du Preparateur en Pharmacie. By P. Goigoux. Cloth, $7^1/_2$ in. by 5 in. Pp. XV + 650. Figures in text, 45. Vigot Frères, Editeurs, 23, Rue de l'Ecole-de-Médecine, Paris. The "aide" or "preparateur" in pharmacy in France serves an apprenticeship of six to eight years. The instruction which he receives is imparted to him verbally by his employer during the day's work. As a result, the scope and thoroughness of the instruction received vary greatly. To overcome these conditions and to provide the "aide" with something tangible to study in the hours when he is not at work, the author has prepared this volume. It is divided into five parts and an appendix. The first part deals with the elements of human anatomy and physiology, forms of medication, and pharmaceutical operations. Part two is devoted to chemistry, including inorganic and organic medicaments. Part three deals with medicinal agents of vegetable and animal origin. Part four is devoted to the galenical preparations, surgical dressings, organo-therapeutic preparations, serums and veterinary remedies. Part five deals with the laws and regulations covering the conduct of a pharmacy and dispensing. In the appendix, there is given a brief outline for the examination of urine and a short code of ethics for the "aide" prepared by M. Edouard Tercinet, Doctor of Law. While the descriptions and discussions are brief, the essential facts are given, and these are presented in language which it is believed should be understandable to the beginner in pharmacy.

A. G. DUMEZ.